DOCUMENT RESUME

ED 170 560 CE 021 352

AUTHOR	Darcy, Robert L.; And Others
TITLE	Vocational Education Outcomes. (Final Report on Year One of the R & D Project "Examining Vocational Education Outcomes and Their Correlates").
INSTITUTION	Ohio State Univ., Columbus. National Center for Research in Vocational Education.
SPONS AGENCY	Office of Education (DHEW), Washington, D.C.
PUB DATE	Jan 79
CONTRACT	300-78-0032
NOTE	375p.; Some part of this document may not reproduce well due to light or broken print
EDRS PRICE	MF01/PC15 Plus Postage.
DESCRIPTORS	*Classification; *Evaluation Criteria; *Program Development; *Program Evaluation; Research; Research Methodology; Thesauri; *Vocational Education

ABSTRACT

A study was conducted to determine what particular outcomes are appropriate for use as criteria to evaluate vocational education programs. Procedures included (1) compiling a list of candidate outcomes, (2) conducting a literature and practice review, (3) formulating a strategy for having outcomes reviewed, (4) developing alternative outcome classification frameworks, (5) identifying the characteristics of appropriate and feasible outcome measures, and (6) screening and selecting a limited number of outcomes for further study. Developed in the course of the study were an evaluative annotated bibliography of vocational education outcome studies, a thesaurus of vocational education outcome questions, and an essay on conceptual and practical issues in outcomes evaluation (all of which are included as attachments to this report). It was recommended that researchers continue their intensive efforts to (1) specify a limited number of important outcomes that are both appropriate and feasible to utilize in evaluating vocational programs and (2) operationalize these outcomes criteria by designing and field testing procedures that can be replicated by other evaluators. The report concludes with applications of the R & D results and recommendations for continuing study. (CT)

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VOCATIONAL EDUCATION OUTCOMES

* * *

(FINAL REPORT ON YEAR ONE OF THE R & D PROJECT "EXAMINING VOCATIONAL EDUCATION OUTCOMES AND THEIR CORRELATES")

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U.S. DEPARTMENT OF HEALTH,
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January 1979

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- Generating knowledge through research
- Developing educational programs and products
- Evaluating individual program needs and outcomes
- Installing educational programs and products
- Operating information systems and services
- Conducting leadership development and training programs

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Report of a Project Conducted
Under Contract No. OE 300780032

The material in this publication was prepared pursuant to a contract with the Bureau of Occupational and Adult Education, U. S. Office of Education, U. S. Department of Health, Education, and Welfare. Contractors undertaking such projects under government sponsorship are encouraged to freely express their judgment in professional and technical matters. Points of view or opinions do not, therefore, necessarily represent official Bureau of Occupational and Adult Education, U. S. Office of Education position or policy.

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FOREWORD

Educational outcomes have commanded increased attention in recent years as the focus of evaluation has shifted from processes to products and impact. Are vocational education programs achieving their goals? What are the side effects of vocational education? What are the tangible payoffs to individuals and society from resources invested in vocational education?

In this report of The National Center's study "Examining Vocational Education Outcomes and Their Correlates," significant progress is demonstrated in understanding the state of the evaluation art and expanding our awareness of the nature and diversity of educational outcomes. An Annotated Bibliography of Outcome Studies (Attachment "A" of this report) documents some of the practical problems confronted in conducting empirical research and evaluation on the outcomes of vocational education. A Thesaurus of Outcome Questions has been developed listing 228 questions about the possible outcomes of vocational education for individuals and society (see Attachment "B" in the report).

These two products, along with an essay that provides needed perspective on the theory and practice of outcomes analysis (Attachment "C"), represent significant contributions to the state of the art in vocational education evaluation. The National Center and other members of the vocational education community can use these products to help answer the questions: What particular outcomes are appropriate for evaluating vocational education programs? How can these outcomes be operationalized for purposes of evaluation? A continuing research and development effort will occur during the second year of this project, along with other specific endeavors alluded to in the essay, which will help improve the quality, credibility, and impact of evaluation efforts in vocational education.

On behalf of The National Center, I want to express appreciation to the Bureau of Occupational and Adult Education, U. S. Office of Education, for sponsoring this study and to a number of individuals who contributed importantly to the success of this project. These include the distinguished members of a National Workshop Panel on Vocational Education Outcomes, including representatives from business, labor and education: Walter G. Davis, Mary Ellen Hillaire, Addison S. Hobbs, O. Louise Lothspeich, F. D. Mack, Gerald Q. Miller, Philip L. Smith, Jerry C. Olson, Wallis E. Pereira, Clio S. Reinwald, Annell L. Simcoe, and J. Robert

Warmbrod. (See Chapter II for information on professional affiliation and geographic location of panel members.)

We are also grateful to Dr. Michael D. Hock of Worthington, Ohio; Dr. Douglas Sjogren of Colorado State University; and Dr. Michael Scriven of the University of San Francisco, all of whom served as consultants for the study; and to the five members of The National Center's Evaluation Technical Advisory Panel: Miss Carol B. Aslanian, College Entrance Examination Board; Dr. George C. Copa, University of Minnesota; Dr. Donald W. Drewes, Conserva Inc.; Dr. Ruth P. Hughes, Iowa State University; and Dr. Daniel L. Stufflebeam, Western Michigan University.

The report was prepared for The National Center by Robert L. Darcy, Kathleen A. Bolland, and Joanne Farley, with the assistance of Carolyn M. Taylor.

Robert E. Taylor
Executive Director
The National Center for Research
in Vocational Education

PREFACE

This report includes a summary of research and development activities, findings, and products resulting from the first year of The National Center's applied R & D study "Examining Vocational Education Outcomes and Their Correlates."

Overall goals for the long-term study (initially proposed as a five-year effort) are to (A) identify, operationalize, and test a pool of outcomes for evaluating vocational education and (B) identify program characteristics and intervening factors highly correlated with these outcomes. During the first year (January 1978--January 1979), effort was focused on three major objectives: (1) compiling a comprehensive list of vocational education outcomes; (2) conducting a focused review of evaluative studies; and (3) developing a framework for analyzing outcomes and the role they play in evaluation.

Reflecting these activities, the report includes a brief discussion of objectives, rationale, and background for the study (Chapter I); a summary of project activities and accomplishments (Chapter II); suggested applications of the R & D results and recommendations for continuing study (Chapter III); an annotated bibliography of vocational education outcome studies (Attachment "A"); a thesaurus of vocational education outcome questions (Attachment "B"); and an essay that provides perspective on outcomes evaluation (Attachment "C"). Appended to the bibliography of outcome studies (Attachment "A") is a categorized annotated bibliography of literature closely related to the study of vocational education evaluation.

While the three attachments are properly viewed as integral, mutually reinforcing components of a single report, they also may be used as separate, self-contained documents.

The basic research question addressed during the first year of this study was: What particular outcomes are appropriate for use as criteria to evaluate vocational education programs? We believe we have made significant progress toward answering this question. However, this report does *not* contain a definitive list of 6, 8, or 10 specific outcomes or "outcome commandments" for vocational education evaluators. Nor do we lay out a step-by-step procedure for producing such a list. Indeed, we have found no simple solutions to the methodological and standard-of-value dilemmas in educational evaluation, only the possibility for making intelligent choices. We hope this opportunity will be fully exploited in the months and years ahead.

* * *

In his foreword, the executive director of The National Center appropriately acknowledged contributions made to this study by a number of individuals. I wish to add to that list the names of Gary Milczarek, Trisha Arthur, and Jeanette McConaughy, who helped with various aspects of the study; Dr. Jo Ann Steiger, Dr. David Pucel, Ms. T. Lynne Peterson, and Dr. William L. Hull, who reviewed a draft of the report; and Pauline Jacobs, whose professionalism, creativity, and secretarial skills contributed so importantly to the success of the project. Finally, Kathleen Bolland and Joanne Farley join me in thanking our colleagues in the Evaluation and Policy Division and other members of The National Center staff for their cooperation and many helpful suggestions during the past year.

January 1979

Robert L. Darcy
Project Director

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EXECUTIVE SUMMARY

This report describes activities and results of an applied research and development project examining vocational education outcomes. Three products were developed: (1) an evaluative annotated bibliography of vocational education outcome studies; (2) a thesaurus of vocational education outcome questions; and (3) an essay on conceptual and practical issues in outcomes evaluation. These products will help answer a research question of fundamental importance to vocational education, namely: What particular outcomes are appropriate for use as criteria to evaluate vocational education programs?

The report is addressed primarily to the research, development, and evaluation communities in vocational education and the broader fields of education and training. Much of the information will also be immediately useful to policy analysts and educational leaders. The report is not intended as a handbook for practitioners. The impact of the report on vocational education audiences, including special needs subpopulations, will be more direct and assessable after completion of the second year of R & D activities.

One of the findings of the study was that discussions, analyses, and reports dealing with vocational education outcomes are often ambiguous. The term "outcome" is frequently used interchangeably with "goal" or "objectives," and operational definitions (empirical indicators) are unclear or inconsistent. In this report, vocational education outcomes are defined as "the consequences of vocational programs." These consequences may affect particular individuals, specific institutional entities, or society as a whole. Outcomes include not just intended benefits but also side effects that may be direct or indirect, economic or noneconomic, favorable or unfavorable. In order to evaluate vocational programs with respect to outcomes, it is necessary to state the outcomes clearly, specify empirical indicators (outcome measures), make quantitative or qualitative observations, identify evaluation standards, and then interpret the findings. Evaluation results can be applied for purposes of program improvement, accountability, and policy-making.

The range and diversity of vocational education outcomes is much greater than typically discussed by policy-makers and studied by evaluators. The report lists 228 outcome questions which illustrate the wide variety of possible results of vocational programs for special-needs subpopulations, women, high school youth, postsecondary students, and adults. Outcomes addressed in these questions range from skill acquisition

and job placement to educational attainment, increased earnings, and such noneconomic outcomes as leadership development and improved self-image among disadvantaged students. The report draws from this comprehensive list of outcome questions a shorter list of thirty questions as well as a table identifying ten outcome hypotheses to illustrate outcomes with high potential for further intensive study.

The number of evaluation studies focusing on outcomes was much smaller than had been expected, and the range of outcomes investigated was even more limited. Numerous vocational education studies were found to be either needs assessments or descriptions of student characteristics, programs and processes, resources, and educational context. Apparently little conceptual and empirical work has been done on vocational education outcomes for women and special needs subpopulations. With respect to the thirty-one empirical outcome studies included in the Annotated Bibliography, a number of methodological and data-related shortcomings seriously limit the validity and generalizability of the findings. It is therefore concluded that empirical research has not documented a substantial body of knowledge concerning the outcomes of vocational education. Additional evaluation studies which repeat the noted shortcomings of design and methodology will not add significantly to our accumulation of knowledge.

Based on the findings of this study, it is recommended that researchers continue their intensive efforts to (1) specify a limited number of important outcomes that are both appropriate and feasible to utilize in evaluating vocational programs and (2) operationalize these outcomes criteria by designing and field testing procedures that can be replicated by other evaluators. It is further recommended that the Bibliography, Thesaurus, and Essay contained in the project report be made available to the research, development, and evaluation community and to people in vocational education leadership and policy-making roles. Implementing these recommendations will promote greater understanding of vocational education outcomes, help improve the quality of evaluation studies, and contribute to the development of a cumulative knowledge base that goes beyond strictly local, ad hoc, and transitory considerations. This in turn should lead to more effective and efficient vocational programs.

CHAPTER I

OBJECTIVES, RATIONALE, AND BACKGROUND OF THE STUDY

A. Objectives of the Study

The basic intent of this study during its first year was to help answer the research question: What particular outcomes are appropriate for use as criteria to evaluate vocational education programs? Longer-term goals were listed in the "Proposal for a National Center for Research in Vocational Education" (p. I-192) as follows:

- "to identify, operationalize, and test a pool of appropriate and feasible outcomes for assessing the effectiveness of vocational education."
- "to identify program characteristics and intervening factors which are highly correlated with these outcomes."

The study was proposed as a "five-year effort."

In the Year-One Technical Plan, four objectives were identified: (1) to develop a comprehensive, categorized list of candidate outcomes for vocational education; (2) to screen and select outcomes for in-depth analysis; (3) to conduct a focused review of research and evaluative studies, informed opinions, and practice to analyze selected outcomes; (4) to synthesize and interpret information about selected outcomes, with particular attention to special need subpopulations."

In a brochure developed several weeks into the project, it was stated "This five-year study of vocational education outcomes aims at identifying criteria that are appropriate and feasible for evaluating vocational education programs. During the first year, emphasis is placed on examining a wide range of outcomes, clarifying concepts, and assessing in a preliminary way the extent to which agreement about outcomes exists among relevant audiences."

As work on the project progressed, objectives acquired more operational meaning and clarity. Professional judgments were made concerning how the objectives might best be interpreted and effectively pursued.

B. Rationale for the Study

Increased understanding of educational outcomes is important because vocational programs increasingly are being evaluated on the basis of impact rather than process. Under the provisions of the Educational Amendments of 1976, states are required to evaluate program effectiveness on the basis of two specific outcome criteria: (a) student employment in training-related occupations and (b) extent to which employers consider students to be well trained and prepared for employment. As expressed in the National Center proposal (p. I-186), it would be "a narrow view" to assert that these are the only relevant indices of the outcomes of vocational education. Numerous other outcomes are identified and regarded by educators and others as being of major importance to individual students and to society (note Figure 3 in Attachment "C" and see Attachment "B"). The Proposal (p. 190f) identified four central issues determining the credibility of an evaluation: (1) clarity and specificity of outcomes, (2) acceptance of the outcomes by relevant audiences, (3) availability of tools/techniques that can sensitively measure the outcomes, and (4) "the feasibility (economic efficiency) of measuring outcomes." During Year One, the first two of these issues were specifically addressed with results that are reported in Chapter II below.

In concluding the statement of rationale for this project, the Proposal stressed "the need to . . . examine outcomes as central to the evaluation issues that vocational education will face in the immediate future and for the years to come. The perennial charges and controversy about the appropriate scope of vocational education outcomes will remain with us . . . . [The] need to become clearer about what we have learned to date on the matter of the outcomes is acute" (Proposal, p. I-191).

C. Research Design and Procedures

This project is identified under terms of the National Center contract as an "independent Applied Research and Development Study." Emphasis in Year One was on exploratory research and the development of "instrumental" products (see Attachments "A", "B," and "C") contributing to our expanding knowledge about vocational education outcomes.

Planned procedures and activities for achieving the first-year objectives included (1) compiling a comprehensive list of candidate outcomes from educational literature and informed persons, (2) conducting a focused review of literature and practice, including outcomes relating to special needs subpopulations, (3) formulating a strategy for having candidate outcomes reviewed by a technical advisory panel and a nontechnical task force, (4) developing alternative classification frameworks for categorizing outcomes, (5) identifying the characteristics of appropriate and feasible outcome measures, and (6) screening and selecting a limited number of outcomes (possibly 6-8) for further intensive study as potential criteria to use in evaluating vocational education. Out of these efforts would come the following products:

- an evaluative annotated bibliography of vocational education outcomes literature
- a compendium of outcome statements (ultimately a "thesaurus" of outcome questions)
- an essay on the state of the outcomes-evaluation art
- a final report comprising the above products as well as summaries of background information, project activities, and recommendations for further research and development

A key activity planned to contribute to these procedures and products was a two-day workshop involving a group of distinguished consultants representing vocational education as well as other fields and interests.

D. Evaluation Perspective and R&D Implications

During Year One, the study was not intended to evaluate vocational programs. Its aim was to expand our knowledge base concerning vocational education outcomes and outcomes evaluation so that the quality, relevance, credibility, and impact of future evaluations will be enhanced.

Specifically, this initial phase of the longer-term applied R & D study was intended to lay the foundation for subsequent conceptual and empirical investigations that will help answer the two research questions addressed by this multi-year study:

1. What particular outcomes are appropriate for use as criteria to evaluate vocational education programs?

2. What specific procedures and methodologies can be applied to the selected outcome criteria to yield accurate, significant, and reliable empirical knowledge concerning the effects of vocational education?

Chapter II summarizes the project activities that were carried out to help build this foundation and describes the accomplishments during the first year of the National Center's project "Examining Vocational Education Outcomes and Their Correlates."

CHAPTER II

SUMMARY OF PROJECT ACTIVITIES AND ACCOMPLISHMENTS

This chapter describes major project activities and accomplishments, points out limitations of the study, and identifies staff, consultants, and other resources involved in the project. For full details on the products of this study, see Attachments "A," "B," and "C."

A. Major Activities and Research Findings

Staff effort during the year focused on six major activities:

(1) formulating strategies and mobilizing resources to accomplish project objectives

(2) conducting a focused review of vocational education outcomes literature and recording the results in the form of an annotated bibliography

(3) compiling an extensive file of statements/hypotheses describing the possible outcomes of vocational education and developing a thesaurus of outcome questions

(4) developing a conceptual framework for addressing substantive concerns of the study

(5) organizing and conducting a national workshop on vocational education outcomes

(6) utilizing a variety of opportunities to assess the perceptions and preferences of vocational educators and others concerning the appropriateness, importance, and feasibility of particular outcomes for further intensive study

Continuing attention in the study was given to special needs subpopulations and the theme of sex fairness. Each of the areas of activity is briefly described below.

1. Gearing Up. Early weeks of the first project year (January 16, 1978 to January 31, 1979) were devoted to reviewing the project proposal (alluded to in Chapter I), developing technical plans, and mobilizing staff. Discussions were held with National Center staff, documents reviewed, and efforts generally made to utilize to fullest

advantage the body of accumulated knowledge in the area of outcomes analysis. Section D and the Appendix to this chapter provide information on staff and other resources used in the project.

2. Review of Literature on Educational Outcomes. A systematic review of literature and practice relative to vocational education outcomes evaluation was initiated in April and continued into December 1978.

Initially, it was expected that upwards of 100 outcome studies published since 1968 would be available for review and some method of screening and selection would have to be applied. What actually happened was that initial extensive searching yielded only approximately 30 reports that qualified as "empirical" studies of "vocational education outcomes." All these studies have been included in the annotated bibliography. During final stages of work on the bibliography, approximately 15 additional appropriate documents were identified but time did not permit their inclusion.

The evaluative annotated bibliography, which was a major product of the literature review, has several parts. Technical notes (Section II) preceding the annotations of empirical outcome studies provide readers a brief primer on methodological issues addressed in the evaluative annotations. The epilogue (Section IV) summarizes the substantive findings and methodological issues in the studies. Finally, an appendix of key related literature is also included in Attachment "A." This provides complete citations and brief annotations of a selection of publications relevant to a contextual understanding of vocational education outcomes evaluation.

3. Compilation of Outcome Statements. One of the earliest efforts in the project was to formulate working definitions of "vocational education outcomes" and "outcome statements" for use as guides in compiling outcome statements. Outcomes were broadly defined as "the consequences of vocational programs." Outcome statements are simply linguistic descriptions of those consequences. Typically, an outcome statement identifies what happens to whom (a person or a thing) and how this comes about. For example, "Students who complete a vocational program acquire entry-level occupational skills." The what is skill acquisition (the outcome). The to whom is students (the affected entity) and the how is by completing a vocational program (the educational treatment). In some instances an educational outcome statement also provides information which answers questions of when, where, and why. These concepts are treated

in detail in Attachments "B" and "C," where lists of outcome questions (hypotheses) are also presented.

The actual compilation began almost immediately and involved an exploratory search of readily available literature as well as discussions with researchers and practitioners in vocational education. Each statement was recorded on a separate file card with the source of the statement and an identification number. Lists were periodically developed from the card file to illustrate outcome statements in designated categories (e.g., individual vs. societal, employment-related vs. education-related) and to provide candidate outcomes for persons to rank-order in importance.

Based on suggestions made by the Evaluation Technical Advisory Panel and a project consultant (see section below on Staff, Consultants, and Other Resources Used), the decision was made to design a thesaurus of vocational education outcome questions to meet the need for a comprehensive, categorized listing of outcome statements. The thesaurus appears in this report as Attachment "B."

4. Conceptual and Methodological Issues. A number of conceptual, definitional, and methodological issues were confronted at the outset of this project. Among them were:

--How to define "vocational education"

--How to identify "a vocational student"

--How to define "vocational education outcomes" (especially important in light of the propensity for practitioners and researchers to use the term as a synonym for goals/objectives)

--How to differentiate between "outcomes" and "outcome measures"

--How to conceptualize the task of evaluating vocational education on the basis of outcomes as opposed to other facets of the education enterprise (such as processes, resources, goals, student characteristics, and school-and-community context)

--How to formulate "outcome statements"

--How to classify or categorize outcomes and outcome statements

--How to "validate" particular outcomes in the sense of legitimizing them as being important and appropriate for use as evaluation criteria

--How to select and rank-order the outcomes that meet the tests of "validity" and feasibility (capability of being measured)

Not all of these issues have been thoroughly analyzed. Attachments "B" and "C," however, address the basic questions and seek to provide the ideas and information that will be useful in subsequent analysis and practice. In particular, the essay "Examining Vocational Education Outcomes: Perspective on the State of the Art" (Attachment "C") is intended primarily as a contribution to the conceptual basis of outcomes analysis.

5. National Workshop on Outcomes. An activity of critical importance in the project was a two-day workshop held at The National Center on July 26-27, 1978. Twelve individuals with backgrounds, interests, and responsibilities in diverse fields both within and outside vocational education (see Table I) were carefully selected as an ad hoc task force to participate in the workshop. Efforts were made to assure that the panel was representative with respect to geographical location, race, sex, educational background, professional responsibilities, and other considerations.

The purpose of the workshop, as stated in the project plan, was "to help identify and validate outcomes appropriate for further study." The rationale was to bring together a heterogeneous group of people interested in vocational education and knowledgeable, as practitioners or scholars, about the world of work. By interacting with staff and each other, the consultants were able to express their differing perceptions and values with respect to a broad range of education-related and work-related issues. A structured agenda provided for small-group discussions (three or four consultants), modified nominal group technique, and other formal and informal interaction procedures.

A preliminary "icebreaker" session was held the first morning to get the participants acquainted with each other and sensitize them to the perspectives, experiences, and values each individual was bringing to the workshop. This was followed by six "activity sessions" held during the intensive two-day workshop. These sessions involved individual, small-group, and large-group written activities as well as discussions and efforts to achieve consensus. The

Table I

CONSULTANTS WHO PARTICIPATED IN THE NATIONAL WORKSHOP ON VOCATIONAL EDUCATION OUTCOMES

WALTER G. DAVIS, Director, Department of Education, American Federation of Labor and Congress of Industrial Organizations.
Washington, D.C.

MARY ELLEN HILLAIRE, Instructor in Native American Studies, Evergreen State College.
Olympia, Washington

ADDISON S. HOBBS, State Director of Vocational Education, Michigan Department of Education.
Lansing, Michigan

O. LOUISE LOTHSPEICH, Director, Career Guidance and Counseling Project, Portland Public Schools, and Chair, Oregon State Advisory Council on Vocational Education.
Portland, Oregon

F. D. MACK, Teacher Educator, Health Occupations, Division of Vocational Education, Central State University.
Edmond, Oklahoma

GERALD Q. MILLER, Vice President for Labor and Industrial Relations, Sharon Steel Corporation, and Chairman, Employers National Job Service Improvement Committee.
Sharon, Pennsylvania

PHILIP L. SMITH, Assistant Professor of Education, Faculty of Curriculum and Foundations, The Ohio State University.
Columbus, Ohio

JERRY C. OLSON, Superintendent, Pittsburgh Public Schools.
Pittsburgh, Pennsylvania

WALLIS E. PEREIRA, Director, Construction Education Program, Association of California Contractors, and Member, Board of Directors of the Industry Education Council of California.
Los Angeles, California

(CONTINUED ON THE FOLLOWING PAGE)

Table I (Continued)

CLIO S. REINWALD, Director, Home Economics and Hospitality Education, Division of Career and Vocational Education, Arizona Department of Education.
Phoenix, Arizona

ANNELL L. SIMCOE, Chairperson, Department of Vocational-Technical Education, Graduate School of Education, Rutgers University.
New Brunswick, New Jersey

J. ROBERT WARMBROD, Professor of Agricultural Education and Past President of the American Vocational Education Research Association, The Ohio State University.
Columbus, Ohio

following topics were addressed: (1) identification of particular vocational education outcomes; (2) categorization of outcomes; (3) clarification and specification of outcome statements; (4) rank-ordering of outcomes according to their importance and appropriateness for use as criteria to evaluate vocational education; (5) criteria for selecting and ranking outcomes; and (6) uses of workshop products and experiences in pursuing project objectives.

Participation in this workshop was limited to the 12 selected consultants, members of the project staff, and a few observers. Because of the closed and intensive nature of the workshop, participants were extremely candid and explicit, both in expressing their own views and acknowledging areas of uncertainty and ambivalence. With respect to rank-ordering of candidate outcomes (see Table II) some agreement was indicated but no clear consensus emerged. The three outcome statements given the highest rankings by the consultants are indicated in the table. It is noted with emphasis that these outcomes are not represented by The National Center or the project staff as in any way constituting a "validated" trio of vocational education outcomes.

The rank-ordering exercise, with accompanying discussion, was valuable because of what it revealed about differences in perceptions, expectations, preferences, underlying thinking, and reactions to the differing views of others. Experience with this workshop session underscored the complexity and subtlety of efforts to "validate" outcomes and reinforced the staff's commitment to avoiding simplistic or authoritarian approaches to the selection of outcomes for further treatment.

What came out of the workshop overall was a deeper appreciation of the conceptual and communication problems inherent in vocational education outcomes analysis. As one consultant stated: "Never again will I be so naive in my thinking and talking about educational outcomes."

The workshop consultants expressed willingness and keen interest in convening again in 1979 for follow-up discussions of issues considered in the July 1978 workshop. They felt that after six months or more of reflection on the workshop experience, combined with an opportunity to review the Year-One final report, they would be in an excellent position to contribute further to the project.

Table II

WORKSHOP ACTIVITY SESSION: RANKING OUTCOMES

Name____________________

Handout for Activity Session #4
RANKING OUTCOMES
****
Thursday, July 27

Listed below are 10 vocational education outcome statements. Your task is to rank the outcomes in terms of their importance and appropriateness as indicators of the consequences of vocational programs. That is, assuming that valid, accurate methods can be devised to observe and/or measure the outcomes, what is their rank-order of importance for use in evaluation? Write number 1 by the most important item, number 2 by the second most important, and so on through number 10, the least important.

____ High school seniors enrolled in vocational programs are more satisfied with their school experience than are comparable students taking academic/general courses.

____ Employers rate vocational students more satisfactory as employees than comparable academic/general students after six months on the job.

② Within six months of program completion, students obtained jobs related to their occupational training.

____ High school dropout rates are lower for vocational students than comparable students enrolled in academic/general curricula.

____ Two years after program completion, vocational students were more satisfied with their jobs than were graduates of academic/general programs holding similar jobs.

____ Parents of high school seniors enrolled in vocational programs are more satisfied with the curriculum than parents of comparable students enrolled in academic/general programs.

③ Within six months of program completion, students obtained satisfactory jobs, though not necessarily in the area of their occupational training.

(CONTINUED ON THE FOLLOWING PAGE)

Table II (continued)

① Upon completion of a vocational program, students were certified as occupationally proficient and ready for entry-level employment.

___ Private sector employers rate high school vocational programs in their communities higher than academic/general programs.

___ One year after program completion, vocational students were earning higher hourly wages than comparable academic/general students holding similar jobs.

6. "Validation" Activities. Throughout the year, continuing efforts were made to "validate" particular outcomes in the sense of determining their appropriateness, importance, legitimacy, acceptance, credibility as evaluation criteria for vocational programs. Discussions were held with numerous individuals concerning outcomes they considered important for use in evaluating vocational education programs. Opinions varied according to the professional identity of the responder (e.g., vocational education practitioner, academic researcher, private sector representatives of business or organized labor); situation in which the question was posed (e.g., small group, large group, substantial orientation, little or no explanation); and the demographic/socioeconomic background of the respondent.

No effort was made to employ a formal Delphi method or conduct scientifically controlled surveys. In part this reflected the staff's judgment that there would be little likelihood of obtaining useful data, i.e., responses that would be representative, well-informed, responsible, valid, authentic, and meaningful. While this approach is not ruled out for the future, the staff is acutely sensitive to the pitfalls of such efforts to achieve consensus, including the risks inherent in arbitrarily designating an electorate and simply counting the votes cast. This approach of selecting the "who" to render value judgments seems less efficacious than developing a sound procedure for how such judgments can be made.

7. Research Findings. Detailed findings from the first year of this applied R & D study of vocational education outcomes are presented in:

- Attachment "A"--"Vocational Education Outcome Studies: An Evaluative Annotated Bibliography Including an Appendix of Key Related Literature;" in particular, see Section IV, which summarizes substantive findings and methodological issues based on studies published during the past decade

- Attachment "B"--"Thesaurus of Vocational Education Outcome Questions;" in particular see Section I

- Attachment "C"--"Examining Vocational Education Outcomes: Perspective on the State of the Art"

We have concluded that at this stage of the multi-year effort there is insufficient basis for announcing a limited selection of particular outcomes for in-depth analysis. While this was considered during the planning and early implementation stages, the action appears inappropriate at this time and might tend prematurely to focus unwarranted attention on such outcomes. We would not want evaluators to think that the selected outcomes were in some sense prescribed by The National Center as "the" criteria to use in conducting evaluation studies, or even as outcomes recommended for priority R & D study. It is important at this stage that we not exclude from further analysis other outcomes of high potential in terms of importance, feasibility, and appropriateness.

Ideally, the selection of outcomes should be grounded in theory and supported by empirical research. If the vocational education community were "clearer on the matter of outcomes" (see Chapter I), a sound basis might now exist for selecting and operationalizing outcomes for use in evaluation. Our recent investigation, however, has confirmed what practitioners and scholars alike have been saying; namely, that a great deal of the evaluation done in vocational education has suffered from serious conceptual, methodological, and data shortcomings. Simply doing more of the same kind of research and evaluation would be unlikely to advance significantly our knowledge of the consequences of vocational education. We therefore are convinced that R & D activities of the type described in this report are necessary and can generate valuable returns as new ways are charted for improved outcomes evaluation in the years ahead.

Uses to be made of first-year findings and a strategy for second-year research and development efforts regarding selection of outcomes for special analysis will be discussed in Chapter III.

B. Research and Development Products and Dissemination Plans

Four applied research and development products resulted from the first year of The National Center's vocational education outcomes study:

(1) "Vocational Education Outcomes Studies: An Evaluative Annotated Bibliography Including an Appendix of Key Related Literature" (included as Attachment "A" in this report)

(2) "Thesaurus of Vocational Education Outcome Questions" (included as Attachment "B" in this report)

(3) "Examining Vocational Education Outcomes: Perspective on the State of the Art" (included as Attachment "C" in this report)

(4) VOCATIONAL EDUCATION OUTCOMES: Final Report on Year One of the R & D Project "Examining Vocational Education Outcomes and Their Correlates" (including Attachments "A," "B," and "C").

Fifteen copies of the complete Final Report will be delivered to the Bureau of Occupational and Adult Education, U. S. Office of Education. Additional copies of the full report will be printed for use by The National Center and for individuals who contributed directly to the study. Arrangements for wider dissemination of the report will be considered through The National Center's cost-recovery document sales program.

Copies of the three respective attachments--the Annotated Bibliography, Thesaurus, and Essay--may also be disseminated through The National Center's cost-recovery sales program as separate publications if market analysis warrants this procedure. It is also possible that the Annotated Bibliography will be divided into two separate publications, namely the Annotated Bibliography of Vocational Outcome Studies and a distinct Bibliography of Vocational Education Key Related Literature.

It should be noted that these documents were developed as "instrumental products," aimed at establishing a knowledge base for carrying forward the multi-year study as described in Chapter I. To the extent that these first-year products serve other immediate functions, they may be regarded as side benefits.

C. Other Accomplishments, Interfaces, and Limitations of the Study

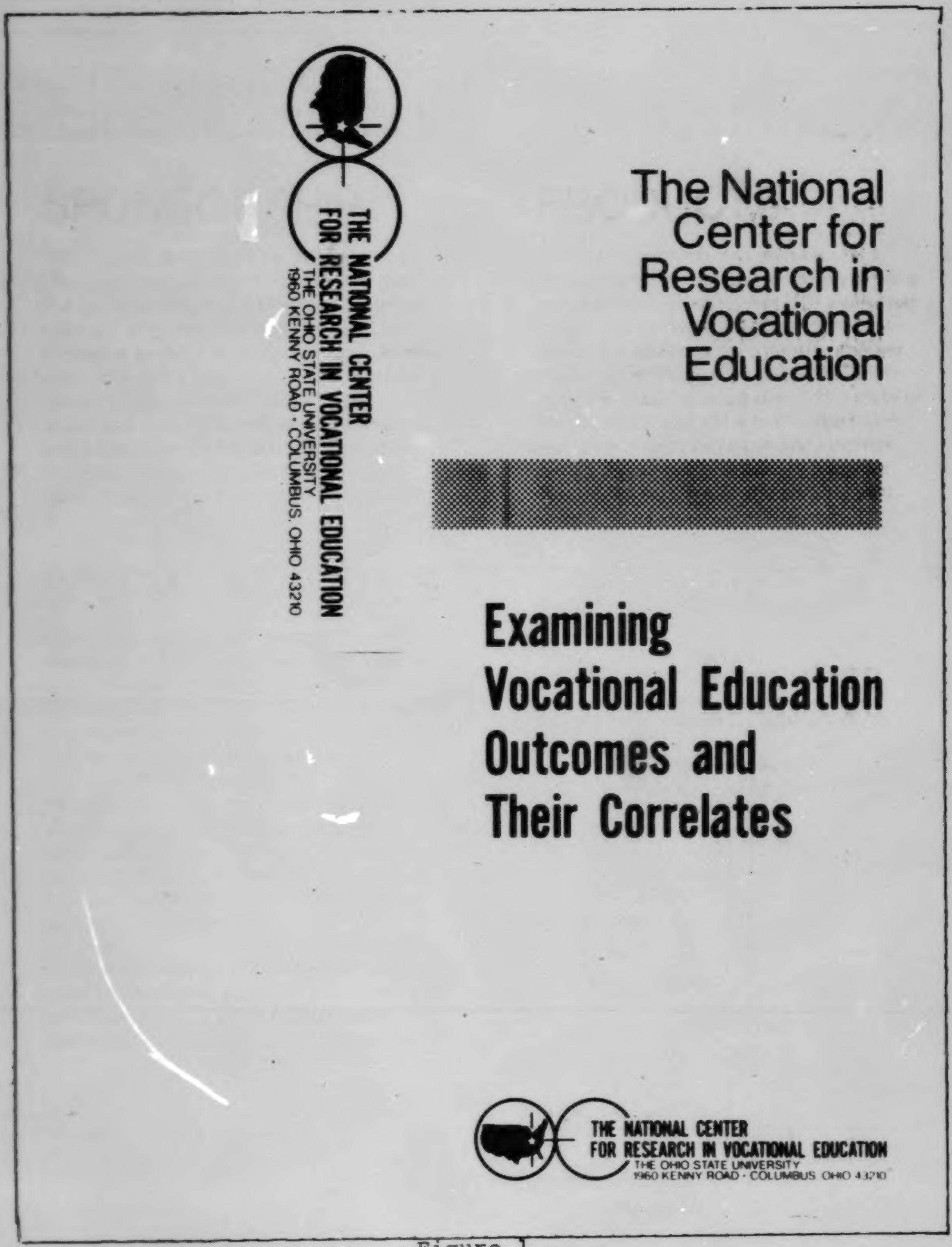
1. Specialized Human Capital. Beyond the tangible products listed in Section B, the most significant project accomplishment during the first year was an accumulation of specialized human capital in the field of outcomes analysis. Staff members developed R & D capabilities in the form of project-specific knowledge, skills, and attitudes which can be applied productively in the second year of the study.

Notable is The National Center's keener awareness of pitfalls in outcomes evaluation and heightened sensitivity to the need for lucid thinking and clear communication if breakthroughs are to be made in this crucial area of vocational education research, development, and evaluation. It is important that we acknowledge what we do not know about outcomes as well as report and use knowledge that we do possess.

2. Interfaces. Members of the project staff took advantage of numerous opportunities to interact with vocational education practitioners and researchers as well as people outside vocational education. Approximately 150 copies of a project brochure published in May 1978 (see facsimile, Figure 1) were distributed in response to requests for information or at the initiative of project staff as a basis for discussion. Individuals were asked to suggest outcomes they personally considered to be highly appropriate for use in evaluating vocational education. In some instances they were given a list of eight or ten or twelve outcome statements and asked either to rank them in importance (for use as evaluation criteria) or classify them as "Very Important," "Important," or "Minimally Important."

As reported in the section on "validation" efforts, these informal polls raised more questions than they answered.

Among the groups with whom project staff interfaced were participants in a "Leadership Conference for Administrators of Vocational Education in Large Cities" (Columbus, Ohio, April 19); staff members of The National Center's Evaluation and Policy Division (luncheon seminar and other occasions) and of the R & D Division and the Information and Field Services Division; participants in the "National Conference on Outcome Measures for Vocational Education" (Louisville, Kentucky, August 16-18, 1978). More limited interfaces occurred with individuals working with educational outcomes at the U.S. Department of Labor (Office of Program Evaluation and Research, Employment and Training Administration); Public Services Laboratory (Georgetown University); Agency for International Development; World Bank; Midwest Economics Association; National Commission for Employment Policy; U.S. Department of Commerce (Economic Development Administration); Library of Congress (Congressional Research Service); staff directors of Congressional subcommittees in the education and employment areas; National Institute of Education; and other educational, research, and human resource organizations.



THE NATIONAL CENTER
FOR RESEARCH IN VOCATIONAL EDUCATION
THE OHIO STATE UNIVERSITY
1960 KENNY ROAD · COLUMBUS, OHIO 43210

The National
Center for
Research in
Vocational
Education

**Examining
Vocational Education
Outcomes and
Their Correlates**

THE NATIONAL CENTER
FOR RESEARCH IN VOCATIONAL EDUCATION
THE OHIO STATE UNIVERSITY
1960 KENNY ROAD · COLUMBUS OHIO 43210

Figure 1

Examining Vocational Education Outcomes and Their Correlates

THE NATIONAL CENTER FOR RESEARCH IN VOCATIONAL EDUCATION
THE OHIO STATE UNIVERSITY
1960 KENNY ROAD · COLUMBUS OHIO 43210

The National Center for Research in Vocational Education's mission is to increase the ability of diverse agencies, institutions, and organizations to solve educational problems relating to individual career planning, preparation, and progression. The National Center fulfills its mission by:

- Generating knowledge through research
- Developing educational programs and products
- Evaluating individual program needs and outcomes
- Installing educational programs and products
- Operating information systems and services
- Conducting leadership development and training programs

Robert E. Taylor
Executive Director

FOCUS

This five-year study of vocational education outcomes aims at identifying criteria that are appropriate and feasible for evaluating vocational education programs.

During the first year, emphasis is placed on examining a wide range of outcomes, clarifying concepts, and assessing in a preliminary way the extent to which agreement about outcomes exists among relevant audiences.

The National Center is studying not only traditional goals, objectives, compliance standards, and presumed benefits such as job placement in training-related fields, but also the broader consequences of vocational education programs for individual students and society. Special needs subpopulations and sex equity—two major themes identified by the National Center for particular emphasis—are addressed in this project.

Beginning in the second year, a number of selected outcomes will be studied to determine how they correlate with program characteristics and other factors.

Figure 1 (Continued)

SPONSORSHIP

The study is sponsored by the Bureau of Occupational and Adult Education under the terms of the U.S. Office of Education contract with the National Center. The Project is an Applied Research and Development task being carried out by the National Center's Evaluation Division. There are important interfaces between this Project and a National Center study focusing on the interpretation of outcome measures (sponsored by the National Institute of Education).

SPECIAL ACTIVITIES

An activity of critical importance in the first year of the study is a workshop to be held at the National Center in July 1978 involving a group of distinguished consultants representing vocational education as well as other fields and interests.

This workshop task force will contribute ideas and judgments concerning particular outcomes, ways of classifying outcomes, priorities, and issues related to developing increased agreement concerning vocational education outcomes.

In addition, Project EVEO will benefit from review and suggestions provided by a technical advisory panel of evaluation specialists from outside the National Center.

PRODUCTS

First-year products will include: (1) a comprehensive categorized listing of vocational education outcomes, (2) a selected list of approximately 6-8 outcomes validated and screened for intensive further study, (3) an evaluative annotated bibliography of outcome studies, (4) a state-of-the-art essay, and (5) a final report summarizing project activities and findings during the year and outlining plans for continuing research in the coming year.

* * *

For additional information, write or call:

Program Information Service
The National Center for Research
in Vocational Education
The Ohio State University
1960 Kenny Road
Columbus, Ohio 43210
(614) 486-3655

Figure 1 (Continued)

Within The National Center's Evaluation and Policy Division, members of the project staff endeavored to maintain especially close liaison with three related evaluation projects: (1) Providing Technical Evaluation Assistance to State Education Agencies; (2) Developing Evaluation Handbooks for Vocational Education; and (3) Increasing the Quality of Vocational Education Evaluation Reports. A brief report on the project was also presented at a meeting of The National Center's Advisory Council.

3. Limitations of the Study. This report covers the first year of a multi-year research and development effort. Activities during this period included detailed planning, start-up, and the development of products that will contribute to answering the research question: What particular outcomes are appropriate for use as criteria to evaluate vocational education programs? Project plans call for generating useful, if not definitive, answers to the question by the end of the second year.

At this stage in the R & D effort we are better equipped to consider when and how to select from the large pool of outcomes those particular outcomes that show high potential on the basis of importance, appropriateness, and feasibility. Indeed, we have already done some preliminary selecting. Table II above lists 10 outcome statements/hypotheses drawn from the comprehensive pool for the purpose of eliciting evaluative responses from the ad hoc panel of representatives participating in the National Workshop on Vocational Education Outcomes. In Attachment "C," Table I lists 30 outcome questions selected from a larger pool to illustrate the diversity of outcome themes, empirical indicators, entities affected, educational treatments, and the like. In sum, we have sharpened our understanding of outcomes, identified a broad and diverse range, considered criteria for selecting from a larger pool of outcomes, and developed an awareness of the sensitive issues inherent in choosing and publicizing a limited set of outcomes to be used as evaluation criteria. We therefore have progressed about 35 percent to 45 percent of the way toward accomplishing the first of the two long-term goals established for this study (see p. 1). With respect to the second long-term goal, the focused review of outcome studies and other project activities have suggested a number of factors which may be correlated with particular outcomes.

Continuing attention throughout the first year was given to the question of how vocational education outcomes relate to special needs subpopulations and the theme of sex fairness. Attempts to identify empirical outcome studies focusing on special-needs groups and sex-equity themes met with disappointment. This is reflected in the paucity of such studies in the Annotated Bibliography of Vocational Outcome Studies (Attachment "A"). A few documents focusing on special groups and sex equity themes have been included in the appendix attached to the Annotated Bibliography. However, these deal with aspects of vocational education evaluation related to but not directly focusing on outcomes per se. This lack of information also made it infeasible to attempt a systematic discussion of these topics in the state-of-the-art essay (Attachment "C").

Project staff met with more success in simply identifying outcomes concerning special-needs groups and sex-equity themes. Many of these came from colleagues in The National Center who are working on projects in these priority areas. These outcomes are reflected in the Thesaurus of Vocational Education Outcome Questions (Attachment "B").

A final limitation of the study is that it has not produced a choice of a classification system for categorizing outcomes. Alternative classification schemes have been reviewed and some remain under consideration. In the Thesaurus of Vocational Education Outcome Questions, we have adopted a classification framework based on practical considerations rather than on substantive or theoretical grounds. For discussion of the complex issues that accompany the task of developing a classification framework, see Section I of Attachment "B."

D. Project Staff, Consultants, and Other Resources

Principal members of the project staff during the first year were:

Robert L. Darcy, Project Director
Kathleen A. Bolland, Program Associate
Joanne Farley, Program Assistant
Carolyn M. Taylor, Graduate Research Associate
Pauline Jacobs, Secretary

Brief resumes of the professional staff are appended to this chapter.

Prior to his appointment (July 1978) as Associate Director of the Division of Evaluation and Policy, Norval L. McCaslin also served on the project staff; and Nancy Powell was half-time project secretary until September 1978.

In addition to the workshop consultants listed in Table I above, the following individuals performed consulting services in support of the project:

Dr. Michael D. Hock, Consultant in Human Services Planning and Evaluation, Worthington, Ohio

Dr. Douglas Sjogren, Professor of Education, Colorado State University, Fort Collins, Colorado

Dr. Michael Scriven, Director, Evaluation Institute, University of San Francisco, San Francisco, California

and members of The National Center's Evaluation Technical Advisory Panel:

Carol B. Aslanian, Associate Director, College Entrance Examination Board, New York City

Dr. George C. Copa, Professor of Vocational and Technical Education, University of Minnesota, Minneapolis

Dr. Donald W. Drewes, President, Conserva, Inc., Raleigh, North Carolina

Dr. Ruth P. Hughes, Head, Home Economics Education, Iowa State University, Ames

Dr. Daniel L. Stufflebeam, Director, The Evaluation Center, Western Michigan University, Kalamazoo

Other resources contributing to this study include the physical facilities, research library, and personnel of The National Center and of The Ohio State University. Budget data are available from The National Center and the U.S. Office of Education.

Appendix to Chapter II

BRIEF RESUMES OF PRINCIPAL STAFF

ROBERT L. DARCY joined the staff of The National Center in January 1978 as Senior Research Specialist. A native of Illinois, he attended public schools in the Chicago suburbs and earned degrees in economics from Knox College (B.A.), Indiana University (M.A.), and the University of Colorado (Ph.D.). Dr. Darcy was Professor of Economics at Colorado State University (Fort Collins) from 1968 to 1975, where he also directed the Center for Economic Education. He earlier served on the faculties at Ohio University and Oregon State University and has consulted for the U.S. Department of Labor, Office of Education, National Institute of Education, The World Bank, and other organizations. He has contributed to books and journals in the field of human resource economics and economic education and is the author of a text for secondary school students, Manpower and Economic Education.

KATHLEEN A. BOLLAND joined The National Center staff as a program associate in March 1978. A native of Michigan, she attended Pontiac Public Schools and earned her B.A. in psychology from Oakland University (Michigan) and her M.S. in human experimental psychology and quantitative psychology at the University of Washington, where she was a research and teaching assistant in the Department of Psychology. She is currently working on a second master's degree at The Ohio State University, in educational research and evaluation. Ms. Bolland gained professional experience as a research associate in private industry and as a program evaluator, grants coordinator, and regional testing specialist for the State of Ohio Department of Administrative Services. She has taught courses in the area of program evaluation for state employees.

JOANNE FARLEY joined The National Center staff in July 1978 as a program assistant. At The Ohio State University (1974-78), Ms. Farley served as a graduate research assistant and teaching assistant for the Department of Political Science. She earned her M.A. in political science and has completed general examinations for the Ph.D., specializing in political theory and international relations. Her research skills include statistical and computer experience. A native of Tennessee, she earned her B.A. in political science and history from Memphis State University.

CAROLYN M. TAYLOR has been a graduate research associate in the Evaluation and Policy Division of The National Center since September 1978. A native of Alabama, she earned her B.S. in secretarial science at Alabama College for Women (Montevallo University) and M.A. at The Ohio State University, where she is currently working toward the Ph.D. in Vocational-Technical Education. Ms. Taylor attended the University of California, Berkeley; San Francisco State University; and Oregon State University. She holds a secondary and community college teaching credential and an administrative services credential from the State of California, where she taught on the secondary level for ten years before coming to Ohio.

CHAPTER III

R & D APPLICATIONS AND RECOMMENDATIONS FOR CONTINUING STUDY

This chapter suggests some immediate and longer run applications of the R & D findings and products resulting from the first year of a proposed multi-year study "Examining Vocational Education Outcomes and Their Correlates." Recommendations are then offered both for carrying this particular effort forward and for related efforts aimed at improving vocational education evaluation.

A. Proposed Applications of R & D Results

The principal results from the first-year effort are more properly characterized as development products--the bibliography, thesaurus, essay, and what was referred to in Chapter II as specialized human capital--rather than research findings or evaluation conclusions. These results have instrumental value as capital goods which can be used in further production, both in The National Center's ongoing studies and elsewhere. The production of knowledge in the area of educational outcomes can, in turn, help improve vocational education policy, program design, program management, and ultimately educational performance and impact.

1. Annotated Bibliography of Outcome Studies. This product (Attachment "A") will be a major source of information on research design and methodology to be used in operationalizing selected outcomes for evaluating vocational programs. Strengths and weaknesses of past studies (see Attachment "A," especially the Introduction, Technical Notes, and Epilogue) will help guide The National Center staff in designing evaluation procedures. Sources identified in the Appendix of Key Related Literature can be more fully utilized in performing the in-depth analysis of a more limited range of outcome issues.

For external uses, the Annotated Bibliography of Outcome Studies represents a unique compendium of recent empirical research and evaluation work in vocational education. While not exhaustive, the list of studies provides a cross-section of what might be termed good, bad, and indifferent evaluative research. To a limited extent it fills the need described by a past president of the American Vocational Education Research Association, who called for a detailed review of the methodology and substance of evaluation studies.

The Appendix of Key Related Literature could prove of great value in helping orient newcomers to vocational education research and evaluation, as well as educational policy analysts and others. While far from exhaustive, the listing nevertheless identifies significant data bases, review and synthesis papers, empirical studies, methodological pieces, and publications reflecting a variety of world-of-work perspectives.

2. Thesaurus of Outcome Questions. The Thesaurus (Attachment "B") provides in Section II a categorized listing of 228 vocational education outcome questions. From this extensive pool, the project staff will draw a number of outcome statements for in-depth study, development, and pilot-testing as criteria to evaluate vocational programs. The conceptual analysis presented in Section I of the Thesaurus will be applied in carefully formulating the outcome hypotheses.

Beyond immediate project applications, it is anticipated that the Thesaurus will serve a number of functions in the hands of external users. The range and diversity of outcomes can help policy makers broaden and deepen their perspectives, suggest different priorities, and indicate possible new evaluative criteria for vocational education. Researchers can peruse the list of outcome questions as potential research topics, noting the subject index for special interests such as sex fairness or the needs of disadvantaged students. The Thesaurus can also be used in developing a checklist of hypotheses that have or have not already been tested.

3. Essay on Outcomes Analysis. The Perspective on the State of the Art (Attachment "C") provides the project staff with a vocabulary and framework for analysis and communication about educational outcomes. The essay identifies a number of specific issues that must be addressed in operationalizing particular outcomes for use in evaluation. It lists some important hypothesized outcomes, describes different types of outcome data, and distinguishes among the various objectives of educational evaluation.

External readers of this product may find the discussion of concepts, models, and issues stimulating and useful as a point of reference for analysis and commentary. Policy makers, vocational educators, and the general public may benefit from an expanded awareness of the broad range and diversity of educational outcomes. The suggested agenda for improving outcomes evaluation may help to crystallize attention and commitment to finding much-needed answers to a host of key questions affecting the future of vocational education.

B. Recommendations for Further R & D Efforts

Through this project and related efforts, 1979 could prove to be a year of significant progress for The National Center in the area of outcomes analysis. Certainly there is a need for careful review and synthesis of the knowledge advances resulting from the Interpreting Outcome Measures study and the state-of-the-art essays (alluded to in footnote two of Attachment "C") as well as the first-year results emanating from this particular R & D study. The highest priority should be given to mining these products for the potentially valuable content they have to offer. It would be a tragic mistake to plunge ahead into new terrain to the neglect of recently produced knowledge not yet processed for use.

1. Second-Year Continuation Plans. Emphasis in the second year will be on operationalizing a limited pool of outcomes that show good potential for use in evaluating the consequences of vocational programs. One or more of the outcome measures will then be pilot-tested during the year to determine the clarity of the hypothesis, adequacy of data, validity and reliability of instruments, and soundness of evaluation design. The procedure will also include (a) an assessment of the extent to which support exists among relevant audiences for the particular criterion and (b) a demonstration of how the evaluation results could be interpreted, generalized, applied, and disseminated.

Results of the operationalizing and pilot-testing will be used to help validate particular outcomes as appropriate criteria for evaluating vocational programs. The validation process will entail soliciting reactions and comments from such audiences as vocational education policy makers, administrators, teachers, and students as well as interest groups such as special needs subpopulations, parents, employment and training practitioners, and local, state, and federal government agencies. Consideration will be given to reconvening the panel of workshop consultants to review progress made in the study and advise on the validation of particular outcomes (see Chapter II, Section A-5 above).

Beyond the Second Year. When the Year-Two operationalizing and pilot-testing of outcomes is completed, further R & D activities and evaluation applications will be continued either as a separate project (as described in The National Center Proposal, p. I-192) or in conjunction with a proposed Longitudinal Study of Former Vocational Education Students and proposed Case Study of Vocational Education Programs to Determine Correlates of Placement.

VOCATIONAL EDUCATION OUTCOMES
(Final Report on Year One of the R & D Project "Examining Vocational Education Outcomes and Their Correlates")

Attachment A

VOCATIONAL EDUCATION OUTCOME STUDIES:

AN EVALUATIVE ANNOTATED BIBLIOGRAPHY INCLUDING AN APPENDIX OF KEY RELATED LITERATURE

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PREFACE

This annotated bibliography is a product of a focused review of the literature and practice of evaluating vocational education outcomes conducted at the outset of a project designed to identify feasible and appropriate measures for assessing the consequences of vocational education programs. It was compiled primarily to provide the vocational education community and other interested audiences a sampling of empirical outcome studies conducted since the enactment of the Vocational Education Amendments of 1968, which mandated evaluation of vocational programs. To a limited extent, it is a response to a call for a detailed review of the methodology and substance of evaluation studies.[1]

Vocational education outcomes are broadly defined as the consequences of vocational programs. These consequences can be attributed to (a) a student's participation in a vocational program and/or (b) the existence of ongoing vocational programs in the community. Outcomes may affect an individual student, society as a whole, or some segment of society such as taxpayers, employers, or a specific community. Vocational programs may be at the secondary or postsecondary level; they may include programs for adults and out-of-school youth. All results, consequences, impacts, or effects of vocational education are considered outcomes, whether positive or negative, intended or unintended, short-term or long-term, economic or noneconomic.

Two types of documents are included in this bibliography. The main body of the bibliography lists empirical outcome studies, that is, studies that report and analyze data concerning the outcomes of vocational programs. The studies utilize data systematically collected and analyzed in a way that can be verified and/or replicated by other researchers. The appendix includes a selection of literature pertinent to the study of vocational education outcomes.

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[1] The proposal for such a review was made by Professor J. Robert Warmbrod in his presidential address at the Annual Meeting of the American Vocational Education Research Association, Houston, Texas, December 6, 1976, "Evaluation Research in Vocational Education," reprinted in the Association's newsletter Beacon, Vol. 6, No. 1 (January 1977) p. 8.

The extensive search for empirical outcome studies as defined above yielded a body of literature closely related to the study of vocational education outcomes: data-base reports; review and synthesis papers; evaluation methodology; evaluations focusing on processes or other non-outcome variables; and other diverse documents. Although this literature does not fit the narrow topic of "vocational education outcome studies," it is fundamental to a contextual understanding of those studies. Further, many of the documents, such as "the GAO Report" and "Project Baseline," are often informally cited in the literature. Therefore, an appendix with the broader topic of "literature related to the study of vocational education outcomes" is included, with full citations and descriptive annotations of these important documents.

This selected bibliography may be useful to a variety of audiences--from experienced vocational education specialists to employment and training planners and interested laypersons. The annotations for both the outcome studies and the key related literature were written with the assumption that some readers with little background in vocational education or educational research may have real and pressing needs for pertinent information that can influence vocational education policy. This document, then, will provide a concise sourcebook on vocational education outcomes research for policy analysts at all levels of government, for academic researchers, for staff members of state departments of education and local school systems, and for practitioners in other fields of education and training.

DECEMBER 1978 KATHLEEN BOLLAND

I. INTRODUCTION TO THE EMPIRICAL OUTCOME STUDIES

This bibliography contains descriptive and evaluative annotations of a selection of empirical studies assessing the outcomes of vocational education. It was compiled primarily to provide the vocational education community and other interested audiences a sampling of substantive findings and methodological issues and to give suggestions for further research. Vocational education outcomes are broadly defined as the full range of consequences that can be attributed to vocational programs, and empirical studies are defined as those studies in which data are collected and analyzed in a way that can be verified and/or replicated by other researchers. Thus, the bibliography includes such documents as reports of follow-up studies of the graduates of particular vocational education programs, annual evaluation reports prepared by state vocational education advisory councils, and doctoral dissertations addressing specific vocational education outcomes. Excluded from the bibliography proper but included in the appendix are general data-base reports; review and synthesis papers; evaluation methodology papers; evaluation studies focusing on student characteristics, context, resources, goals, or processes of vocational education; and other publications that are related to vocational education evaluation.

The studies annotated in the bibliography were selected through a two-stage process of identification and review. In the first stage, a variety of sources was consulted in a search for documents addressing topics under the broad heading of vocational education evaluation. This encompassing identifier was used in the initial stage since the more narrow term "vocational education outcome studies" is infrequently used and does not even elicit immediate recognition from many vocational education researchers. During this first-stage search, National Center staff and other vocational education professionals were consulted, two computer searches were initiated,[1] and bibliographies of already collected documents were screened.

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[1] A search of the Educational Resources Information Center (ERIC) system was conducted and references were retrieved and scanned for relevance to the project. Among the descriptors used, singly and in combination, were vocational education, vocational follow-up, measurement, and program evaluation. A search of the Comprehensive Dissertation Index was also conducted -- (footnote continued on the next page)

In the second stage, the identified documents were reviewed. Those not reporting empirical studies of the consequences of vocational education were excluded from the bibliography proper. Some of these documents such as descriptive reports of vocational education, evaluation handbooks, literature reviews, and papers providing only anecdotal evidence concerning educational outcomes are listed and annotated in the appendix of key related literature. The remaining documents were judged to be bona fide empirical evaluation studies. Those retained for inclusion in the bibliography were selected to

1. reflect the broad scope of vocational education outcomes research
2. utilize primary sources insofar as possible
3. illustrate evaluation research and analysis methods as well as findings
4. identify research constraints and related problems

Using this identification and review process, thirty-one studies were selected for the bibliography. Bibliographies of those documents were reviewed for other studies and National Center staff and outside consultants were asked to identify other studies that should be included. Although several other studies exist, these sources indicated that they were not so different from those already identified as to constitute important additions. Thus, this listing does not exhaust the available literature, nor is it a random sample of the qualitative variation in research activity. Basically, however, it is indicative of both the substantive and methodological range of contemporary evaluations of vocational education outcomes.

Each annotation begins with discussion of the research questions and hypotheses; the study design, data sample, and time frame; the variables and statistical analyses (if any); and the results and conclusions. It concludes with an evaluative segment addressing some of the salient methodological and substantive issues inherent in each study.

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[1] footnote continued -- and references retrieved and scanned. Among the descriptors used were vocation(al), occupation(al), postsecondary, community college, secondary, adult, dropout, outcome, impact, followup, evaluation, effective(ness), benefit, cost, minority, women, Indian, handicap(ped), disadvantaged, bilingual, migrant, multicultural, blind. Combinations of these and other descriptors were used as well. In both searches, most of the documents identified were not reports of empirical outcome studies.

Although applied researchers, including evaluators, must balance methodological concerns with concerns for factors affecting the utility of results (such as timeliness and political viability), the latter issues are more difficult to assess through reading an evaluation report. The evaluative comments, thus, are intended not to serve as meta-evaluations[2] but to alert the reader to factors influencing the credibility of the results. Therefore, questions are raised concerning such issues as appropriateness of design, generalizability of findings, consideration of relevant variables, and clarity of reporting. Notable features and strengths of the study may be highlighted. The substance of the annotations is further discussed in the "Technical Notes" following this section.

ED numbers, where provided in the citations, refer to the accession number prefix sequentially assigned to documents as they are processed into the Educational Resources Information Center (ERIC) system and published in the monthly abstract journal, Resources in Education (RIE, published by the National Institute of Education). The documents, except as noted in RIE, are available from the ERIC Document Reproduction Service (EDRS), in either microfiche or hard (paper) copy. The address is: P. O. Box 190, Arlington, Virginia 22210. Also, many university libraries have collections of ERIC microfiche. When no ED number is given for a particular document, it presumably has not been entered in the ERIC system.

II. TECHNICAL NOTES ON ANNOTATING THE EMPIRICAL OUTCOME STUDIES

Evaluation is a term that has several meanings, depending on the orientation of the user. A standard educational evaluation text[3] lists five different usages of the term.

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[2] For a discussion of standards and guidelines for evaluating evaluations, see Daniel L. Stufflebeam. "Meta-evaluation." Occasional Paper Series (No. 3). Kalamazoo: The Evaluation Center, Western Michigan University, 1974.

[3] Blaine R. Worthen and James R. Sanders. Educational Evaluation: Theory and Practice. (Worthington, Ohio: Charles A. Jones Publishing Co., 1973) p. 20.

For this bibliography, we did not choose any one meaning, but rather annotated documents that are characterized as evaluation reports by their authors or that are used as evaluation reports by some audience (for a discussion of diverse definitions of evaluation, see Attachment "C"). However, we maintain that regardless of definition, the process of evaluation is a process of inquiry. Although evaluation as a generic term may differ from research,[4] when evaluators set out to collect data (that is, to inquire), they are not exempt from the canons of research, from the scientific tenets of "the conduct of inquiry."[5] Although evaluators must balance concerns for methodological issues such as validity with concern for practical issues such as timeliness, it is our contention that a timely evaluation report of questionable validity is a more serious error than an untimely but valid report. The latter report may be of use to an audience other than that for which it was intended, whereas the former is of little use to anyone. Thus, although empirical research is not the only legitimate evaluation strategy, and a case may be made for a multiplicity of evaluation strategies (including the case study approach, for instance), the evaluative comments are made from an empirical research perspective.

Descriptive and Evaluative Annotations

A checklist of important components of an evaluation report was developed[6] and used to organize each descriptive annotation (see Table I). As alluded to in the above discussion, the outline is similar to one that would characterize any other scientific research report.

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[4] For a discussion of this issue, see Worthen and Sanders. Educational Evaluation.

[5] A short bibliography of research design texts and evaluation report checklists will conclude these technical notes. See, for instance, Abraham Kaplan, The Conduct of Inquiry: Methodology for Behavioral Science. (Scranton, Penn.: Chandler, 1964).

[6] These components were not drawn from any one source; however, discussions of them can be found in several research design texts such as those listed in the reference section concluding these notes. Terminology and relative emphasis vary among authors (reflecting diversity in usage by researchers), but there is little disagreement about the basic components.

The evaluative comments are more judgmental than the descriptive annotations, both in their substance and in the selection of issues on which to express professional judgment. Although the comments address the methodological issues surrounding the components of the evaluation report checklist (Table I), space limitations prevent detailed critiques of every issue.[7] The evaluative comments focus on selected aspects of credibility and policy utility: from the information given in the report, (1) to what extent are the conclusions warranted, (2) are the conclusions relevant to the stated purpose of the study, and (3) can the conclusions be generalized in such a way that they contribute to a body of knowledge about the effects of vocational education? Suggestions for improving further research are made, and the completeness and clarity of the reporting are addressed as well.

To provide a basis for the assessment of credibility and utility, certain information must be presented in the report and that information must indicate that certain methodological practices were followed. The evaluative comments focus on some salient issues. For example, what aspects of the report contribute to the reader's credence in the conclusions? What was done especially well, and what was lacking? It cannot be overly stressed that we do not address all the issues exhaustively.

Following is a brief discussion of the issues that are emphasized. It should be understood that although an ideal study would be methodologically perfect, situational constraints and imperatives (lack of adequate time, money, expertise, . . .) can prevent the goal from being reached; these constraints and imperatives are not always discussed in an evaluation report. The negative comments therefore are not meant as accusations but are intended to alert the reader to factors attenuating the credibility of the conclusions.

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[7] A thorough critique of an evaluation report could easily take five to ten pages; and some are even longer. See, for instance, the critiques published in The Journal of Vocational Education Research, Vol. 1, No. 1, Winter 1976.

Table I

CHECKLIST OF COMPONENTS OF AN EVALUATION REPORT

_____ Statement of purpose, hypotheses, questions

_____ Contextual factors

_____ Population, sample

_____ Design, data, procedures, instruments

_____ Data treatment and analysis

_____ Results

_____ Conclusions, implications, recommendations

_____ Sponsor of study, professional identity of evaluator

Completeness and Clarity of Reports

It is important that sufficient detail be included in the report to allow readers to mentally reconstruct the procedures followed, the instruments used, and the groups studied. The readers need this information to judge the appropriateness of the methodology and to determine how similar the programs and students studied are to those they are comparing. Thus, not only must all the requisite information be given, it must be provided without ambiguity. Terms such as "program completers" and "early leavers" must be defined, differences between such groups as "vocational students" and "non-vocational students" must be explained, and the exact data collection and analysis procedures must be described.

Multiple reports are sometimes written, each with information important to a specific audience. In such cases, each version may not contain all the information discussed here. However, when multiple reports have been written, each report should make reference to the other reports, indicating the audiences to which they are addressed and the scope of the included information.

When inquiry is conducted for exploratory purposes, detail sufficient to enable the readers to grasp the general idea of what was done is adequate. However, when research is done to verify an hypothesis, the amount of detail must be such that researchers who read the report can replicate the procedures if they wish. (The topic of verification is covered more fully in the next section.) The acquisition of a body of knowledge is dependent on replication of research. Although statistical analyses can indicate the likelihood that an observed phenomenon is a function of chance, repeated replications of procedures yielding the same findings are necessary to provide further assurance that they were not chance occurrences.

Statement of Purpose, Hypotheses, Questions

When engaging in inquiry, one must distinguish between the "logic of discovery" and the "logic of justification." The logic of discovery applies to the formulation of hypotheses. There are several methods of formulating hypotheses: for example, they may be based on theory, they may be grounded in observation, or they may be strictly hunches.[8] There are no formal rules that exhaust the possible procedures for discovery of hypotheses, but in both scientific and everyday discourse, a number of formal procedures for confirming or verifying hypotheses can be identified.[9] These procedures fall under the rubric of the logic of justification; some of them will be discussed in the following sections. Because the suitability of methodological procedures depends on the purpose of the study (discovery or justification), it is important that an evaluation report include a purpose statement.

The specific objectives, which should be stated as evaluation hypotheses or questions, as well as the overall purpose, will have implications for the choice of methodology. Again, in order for the reader to judge the suitability of the methodology, the specific objectives of the evaluation endeavor must be stated. The reader is cautioned to review the methodology used in every study to see if it is appropriate and adequate to answer the questions posed.

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[8] Some philosophers of science suggest that an hypothesis derived from a particular theory is more acceptable than one derived from no particular substantive context. See, for example, Karl R. Popper. The Logic of Scientific Discovery. Rev. ed. (London: Hutchinson and Co., 1968), Chapter 30.

[9] See, for example, Kaplan. The Conduct of Inquiry: Methodology for Behavioral Science.

Contextual Factors

Any contextual factors that may affect the interpretation of the results should be discussed. The time frame is an important example: When was the study conducted? What time elapsed between the occurrence and the study of it? When were the data analyzed and reported? These time factors are important because, for example: (1) Some event may have occurred during the study affecting its results, even though not directly related to vocational education. (2) One may question the accuracy with which respondents recall details of their first jobs, if questioned ten years later. (3) The accuracy of the researcher's recollections is questionable when data are analyzed two or three years after collection. Other contextual factors include geography and events that are not necessarily indicated by time-frame information (events with far-reaching consequences are generally known by their dates, but more local events are usually recalled from a different standpoint).

Population and Sample

The study's population is the universe of people, objects, or events in which the evaluator is interested. Statistically significant results of a scientific study can be generalized to the designated population if appropriate sampling techniques are used (treated further in the Data Analysis section). Thus, the population must be specified.

In some cases, researchers are able to collect data from or concerning the entire population. In most cases this is not feasible, however, so the researcher selects a sample from the population. Appropriate sampling techniques must be used to ensure that results from the sample are representative of results that would be obtained if the whole population were studied. The sampling procedure used, therefore, must be specified. Sampling techniques and issues are described in various survey research texts as well as in some more general research texts.

When a sample is chosen but some data are missing because not everyone (a) was available for an interview, (b) returned the questionnaire, or (c) answered all questions, the subset actually used in the study is sometimes referred to as the study sample. What constitutes the study sample and the bases on which it differs from the original sample should be specified.

It is important that full information be reported concerning the population, the sample, and the study sample. Terms must be defined, procedures must be described (how the sample was chosen, what rules were used to determine which data were unusable . . .), and numbers must be provided (size of the population, size of the sample, size of the study sample). For example, if it is merely stated that the response rate was 64%, it is not clear whether the study sample was 64% of the population or of the original sample. Conclusions reached on the basis of a large percentage of returns from a small but carefully selected sample may be more valid than those based on a small percentage of returns from a large population even if the population and the study sample sizes are equal in both cases.

Bias is an important issue related to sampling. When the original sample and/or study sample are not representative of the population, they are said to be biased. Biased samples can be purposefully selected, as when a teacher considers only the best students and then reports that most of the students got jobs; or they can occur beyond the control of the researcher, as when students without jobs fail to return a questionnaire asking about their employment status. Not only should researchers choose sampling and data-gathering techniques to minimize bias, but they should report relevant characteristics of the study sample in comparison with characteristics of the population in an effort to determine the existence of bias. For example, in a study where sex may make a difference, the ratio of males to females in the study sample should be compared with the ratio of males to females in the population. Statistical techniques can be used to overcome problems of bias in some situations.[10]

The size of the study sample is one of the factors contributing to the power of a statistical test. The study sample must be large enough to ensure that if there are true effects, they can be statistically demonstrated. This is somewhat akin to needing a magnifying instrument powerful enough to make observable something that exists but cannot be seen with the naked eye.

Design, Data, Procedures, Instruments

The choice of research design, procedures, and data-collection instruments is influenced by such factors as purpose, available resources, and political constraints; trade-offs are inevitable. Although the readers of evaluation reports are generally not in positions to judge the choice of such specifics, they should be able to follow the evaluator's logic in moving from purpose to design.

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[10] See, for example, William G. Cochran. Sampling Techniques. (New York: John Wiley and Sons, 1977).

The basic design issue is validity. Does the chosen design allow warranted conclusions to be drawn about the evaluation questions or hypotheses? One must question whether someting other than the treatment (in this context, vocational education or some aspect thereof) can be responsible for the observed effect. There are many threats to validity and several research designs developed to attenuate them. A brief summary of a few of the common research designs, adapted from a classic text, is presented in Table II.

Table II

SOME COMMON RESEARCH DESIGNS

1. The One-group Pretest - Posttest Design: One group receives a pretest, a treatment, and a posttest. There is no control over the possibility that factors other than the treatment were responsible for any changes that occurred. (If this design is used, a correlated t-test is an appropriate statistic for data analysis.)
2. The Static-group Comparison: Two intact groups are chosen. Only one receives a treatment; both receive a posttest. There is no adequate assurance that both groups were essentially the same before the one group received the treatment. (If this design is used, a t-test is an appropriate data analysis technique.)
3. The Time-series Experiment: A series of measurements is taken on a group, a treatment is given, and the series is continued. Something other than the treatment may have caused any observed change in pattern. (Many factors must be considered in choosing the appropriate statistical analysis.)
4. The Nonequivalent Control Group Design: Two intact groups receive a pretest, one group receives a treatment, and both groups receive a posttest. Control of some of the threats to validity depends on the situation.

Source: Adapted from Donald T. Campbell and Julian S. Stanley, Experimental and Quasi-Experimental Designs for Research. Chicago: Rand McNally, 1963.

In addition to deciding on a general research design, the evaluator must make several specific decisions relative to data, procedures, and instrumentation: (1) What is the nature of the data to be collected? (2) From whom should data be collected? (3) When should data be collected? and (4) How should data be collected? The evaluation report must indicate the chosen alternatives and their rationale in sufficient detail that the reader may judge whether the data, procedures, and instrumentation are appropriate and adequate to the purpose of the evaluation. These four issues are interrelated and complex; only a few of the important factors will be discussed here. The research design texts listed at the conclusion of these notes provide much greater detail. In addition, the book by Stufflebeam and others (1971, p. 22) discusses the limitations of research paradigms for evaluation studies.

The general class of data necessary to answer the purpose of an evaluation will be more or less obvious depending on the specificity of the purpose statement, and it is the evaluators who must convince their audiences that they have chosen appropriate outcomes to study and appropriate data to assess those outcomes.[11] Not only must an outcome--for instance, earnings--be specified, but it must also be operationalized, that is, it must be defined in a way that clearly indicates how it is to be measured. Further, the evaluator must justify the operationalization--for instance, on what basis was a choice made from several possible choices, such as weekly earnings, annual earnings, and average earnings.

The general question of data sources raises two more specific questions: (1) Should the data be collected directly from members of the population or from other sources? and (2) What comparisons should be made? For example, information about the job duties of a population of employees could be sought from a sample of the employees or from their employers. Tradeoffs among such factors as accuracy, feasibility, and cost are sometimes necessary in choosing a data source. The evaluation report should provide a rationale for the choices made.

If conclusions about the effectiveness of vocational education are to be drawn, some comparisons must be made. The variables being studied indicate what should be compared, e.g., earnings, but for purposes of evaluation, these variables must be compared against some standards.[12] The standards may be relative, e.g., one group of graduates compared to another, or they may be absolute, e.g., an employee's performance compared to a stated level of satisfactoriness.

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[11] See Attachments "B" and "C" for further discussion of this point.

The choice of a standard or a comparison group is relatively easy when there is a theoretical reason to suspect that the performance of a group should be different after its participation in a vocational education program or different from that of a group that did not participate. Ideally, the theory would even specify the nature of the difference. When evaluators make comparisons, they should specify the rationale for their choice of standards. The reader then can judge whether appropriate comparisons have been made. When standards are not stated it should be indicated that it is left to the readers to compare the descriptive data presented with whatever standards they prefer.

How the data are to be collected is another issue that involves many tradeoffs. The best technique is often the most expensive (see Table III for some data-collection methods). Once a method, such as personal interviews or mailed questionnaires, has been chosen, an instrument must be selected as well. An instrument may be developed for the research project or one already available may be chosen. In either case, questions of validity and reliability should be addressed as well as conditions of administering the instrument.

Table III

SOME DATA COLLECTION METHODS

METHOD	STRENGTHS	WEAKNESSES
Mechanical Devices (e.g., videotape)	Elimination of human errors Reliability	High cost Complexity
Observation	Natural settings available Subtleties perceived by trained observers	Artifical situation created by observer's presence Variation in reliability Meaningful factors possibly overlooked by observer

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[12] See Eugene J. Webb and others. Unobtrusive Measures: Nonreactive Research in Social Sciences. (Chicago: Rand McNally, 1966) for a discussion of comparisons, pp. 5-10.

Table III (Continued)

SOME DATA COLLECTION METHODS

METHOD	STRENGTHS	WEAKNESSES
Questionnaires	Honest, fostered by anonymity Low cost	Possibility of low percentage of returns Respondents' lack of understanding Superficial responses easy Return biased by nature of the questions
Interviews	Provision for flexibility Provision for response in depth	High cost Skilled interviewers required Difficulty of summarizing Many biases possible
Rating Scales and Checklists	Low cost Ease of completion Objective scoring Standardized response	Not all alternatives encompassed May tell more about respondent than about topic under consideration
Self-Reports	Economy Inclusion of emotion-laden material	Difficulty of analysis High degree of subjectivity May be threatening
Tests	Assessment of reliability Analysis of items Ease of scoring	Validity of questions doubtful Other methods often excluded Triviality of questions Other alternatives not covered Precision of format masking poor items
Performance Samples	Direct measure of ability and mastery	Difficulty of administering High cost Problem of reliability Artifical situation
Unobtrusive Measures (e.g., "wear on carpet")	Nonreactive Not consciously biased Availability and measurability	Questions of ethics Questions of validity

Source: Adapted from material presented in Worthen and Sanders Educational Evaluation and from other sources.

It is important that an instrument be both valid, that is measure what it is said to measure, and reliable, that is consistent in its measurement. Neither validity nor reliability is inherent in an instrument; both depend on factors of the situation in which the instrument is used. Still, if an instrument has been demonstrated to be valid and reliable in a given situation and it is to be used in a similar situation, assertions of probable validity and reliability are reasonable.

There are several kinds of validity and corresponding ways to assess[13] them but for present purposes an example will suffice. To assess the capability of Test A to measure the ability of individuals to perform Task X, the test can be given to individuals known to have different levels of X ability. If the variance in scores on Test A corresponds with the known variance in ability to perform X, the test is said to have concurrent validity.

Although there are several ways to assess reliability, it is a unitary concept. If a measuring device consistently yields the same measurement when applied to a phenomenon, it is said to be reliable. Thus, a thermometer that always reads 100°C when placed in boiling water is a reliable instrument, whereas one that varies, either randomly or with some other variable, is not. Although the thermometer is just as reliable if it always reads 90°C when placed in boiling water, it cannot validly measure water temperature. The reliability of tests of knowledge is assessed by comparing scores on alternative forms of a test, by comparing scores on odd items with scores on even items (assuming that overall, all items test the same pool of knowledge), or by comparing scores on two different administrations of the same test.

Reliability and validity are difficult to distinguish and to assess with certain measures of the hypothesized outcomes of vocational education. Still, it is important to assess them insofar as possible. A questionnaire should not be assumed to elicit required information, from the point of view of the researcher, without some "reality-check." Nor should responses to an interview be assumed to be factual.

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[13] Predictive validity, content validity, construct validity, and face validity are among the several types of validity that can be assessed. See J. P. Guilford. Fundamental Statistics in Psychology and Education (New York: McGraw-Hill, 1965).

Questions may be misinterpreted in some cases, and in others a respondent may not have accurate information or, having it, may not want to give it. Questionnaire items may be misunderstood by all individuals in a sample or by some specific set of individuals.

Standard techniques found in research texts for assessing validity and reliability often cannot be applied to measures of vocational education outcomes because they are designed for such purposes as multiple-choice tests of knowledge, attitude scales, or performance tests. Still, it is necessary to determine if the techniques used to gather vocational education outcomes data are valid and reliable. A general method that can be used in many instances is pilot-testing. To pilot-test an instrument or other data-gathering technique, evaluators select a small representative sample from the population of interest and collect data from that sample. They then attempt to verify the information received. One procedure is to discuss the data collection device with the members of the sample to determine their understanding of what was being asked. Another is to elicit the same information from another source. For example, if parents are questioned about employment of their children, their information can be verified by questioning the children themselves and their stated employers. If results of a pilot test indicate that the measuring devices accurately measure the content of interest to the evaluator and do so consistently, it is reasonable to assume that the devices are valid and reliable for other samples from that population. Another method that can be used to support claims of validity is the use of a panel of subject-matter experts. The panel would judge whether the instrument, for example, a questionnaire or interview schedule, covered the domain of interest.

Another factor related to data collection should be discussed in an evaluation report: the conditions of instrument administration. These conditions may impact on reliability and/or validity. For example, little credence can be placed in interview data obtained from untrained interviewers or from data collected under uncomfortable physical conditions (for example, questionnaires completed in a cold room).

Data Analysis

For some purposes, simple presentation of data may be sufficient. Even in these cases, though, care should be taken to guard against misleading tables. When statistical analyses are used, even greater care must be taken. Many assumptions and conditions underlie most statistical techniques and although many can be violated without detracting from the usefulness of the statistic, some cannot be.[14] It is particularly important to meet assumptions when parameters such as unemployment rates are being estimated, whereas when patterns of outcomes such as job satisfaction are being explored, violations of assumptions may not be so critical.

Results

Interpretation of statistical findings must be done with care.[15] Statistical significance indicates that an observed effect (for example, higher salaries for vocational graduates) is not likely a function of chance variation in the selected sample but further statistical tests can sometimes be done to indicate how much of the variation is a function of the treatment in question (for example, vocational education). With correlations, for example, when the correlation coefficient is squared and then multiplied by 100, the resultant percentage indicates the variance explained. With large sample sizes, statistical significance is often found even though the explained variance is very low; when this occurs, it indicates that the results have little practical significance. A careful reading of the report is needed to determine whether the stated results are an outgrowth of the reported data.

Conclusions, Implications, Recommendations

Some evaluation reports may simply present data and summary results, leaving the policy maker to draw conclusions. When conclusions are drawn, implications stated, and/or recommendations made in a research report, they should be based on the data.

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[14] For example, assumptions that the population is homogeneous and that the variables under study are normally distributed in the population. These assumptions are treated in statistical texts.

[15] See Darrell Huff. How to Lie with Statistics. (New York: W. W. Norton and Company, Inc., 1954).

Sponsor of Study, Professional Identity of Evaluator

The identity of the sponsor and of the evaluator can affect the credibility of an evaluation report, both positively and negatively. Some sponsors may be known for requiring quality work and others for preferring results that support their positions. Similarly, some evaluators are recognized for accurate, unbiased inquiry while others become so involved in the subject of their inquiry that their results are suspect.[16]

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[16] See Ernest Nagel, "The Value-Oriented Bias of Social Inquiry," in May Broadbeck (ed.). Readings in the Philosophy of the Social Sciences. (New York: The Macmillan Co., 1968).

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III. EMPIRICAL OUTCOME STUDIES

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[1] Complete bibliographic citations for these titles are provided with the annotations on the pages that follow.

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Vocational Technical and Adult Education: Student Follow-up Study of 1974-1975 Completions. Jim Preston, 1976. 134

III. EMPIRICAL OUTCOME STUDIES

B. Citations and Annotations

The Adequacy of Vocational and Technical Education. South Carolina Advisory Council on Vocational and Technical Education. Columbia: South Carolina Advisory Council on Vocational Education, February 1976, 46 pp. (ED 126 315)

DESCRIPTIVE ANNOTATION:

The South Carolina Advisory Council on Vocational and Technical Education culminates its evaluation responsibilities each year by preparing and publishing an annual evaluation report. It became apparent, however, that "If one is to adequately evaluate the 'effectiveness' of programs, what better perspective exists than that of the employers?" This study was initiated to explore that often-neglected perspective. Many questions were asked:

- Are technical and/or vocational centers a good source of trained, prospective employees?
- Do the centers meet the needs of business and industry?
- Do they meet the needs of the students?
- How do graduates of the centers compare with other employees?
- What is the quality of this education?

Recommendations concerning any aspect of the centers were sought as well.

Ten thousand employers of large companies within the state constituted the population for the study; questionnaires were sent to each of them. Usable returns were received by the cutoff date from 1161 employers, a response rate of 12%. Characteristics of the respondents are discussed and presented in tables. A cross-sample of the South Carolina business and industrial community and of the geographic regions of the state were represented. The survey form was mailed in October 1975. The questionnaire does not ask when employers had experience with graduates of vocational and/or technical centers.

The survey questionnaire, drawn up by a consulting firm, was designed to answer the basic questions the advisory council had raised. After review by a committee of the council and by representatives from vocational and technical education, it was revised. The instrument is appended.

The data are presented in tabular form; comparisons are sometimes made between all respondents and those respondents who have hired vocational/technical graduates. Some data are presented as frequencies and percentages of employers giving particular responses to specific questions; others are in the form of average responses and rank orders. Some of the recommendations are listed with the percentage of respondents making each recommendation.

Among the conclusions discussed are the following:

- Employers consider both vocational and technical centers a good source of trained employees, generally rating those employees higher than others.
- Both vocational and technical centers meet the needs of business and industry and of the students, but excel at meeting the needs of students.
- Employers are more familiar with technical education centers/colleges than with area vocational education centers.
- Vocational and technical programs are oriented more to manufacturing than to other categories of business and industry.

Specific recommendations are made to the State Board for Technical and Comprehensive Education, to the State Board for Vocational Education, and to the State General Assembly. Included are recommendations for continued funding and for greater dissemination--to the public--of information regarding available programs.

This study was initiated by the South Carolina Advisory Council on Vocational and Technical Education. The Dunn and Bradstreet, Inc., Marketing Services Division was hired because it had access to the desired population (through computer files of addresses) and because the council had confidence in its research capabilities.

EVALUATIVE COMMENTS:

This study is useful in an exploratory sense because it suggests areas for further research. The low response rate makes such research necessary before findings from the study can be more than suggestive. The additional research should focus on different occupational areas. For example, do employers of trade and industrial students view vocational education differently from employers of business students?

Another question that can be raised from this study concerns the extent of experience employers have had with vocational students and what effect, if any, that has on their perceptions. If employers have hired only two students each, one would expect their perceptions to be less indicative of the results of vocational education than the perceptions of those employing hundreds of vocational students.

The researchers selected a large sample hoping to obviate bias both from respondents with vested interests in the program and from those who tend to give answers they believe desired. In further research, an attempt should be made to assess response bias, and techniques of questionnaire construction should be used to minimize some kinds of bias. For example, a forced-choice format can be used to prevent respondents from giving "desirable" responses.

One conclusion drawn in this report is that although vocational and technical centers meet the needs of business and industry, they better meet the needs of students. This issue may deserve further study. Some questions are obvious:

- What are the policy implications of this statement if it is a widely-held employer perception?
- What are the implications if it is indeed "true"?
- Are the implications such that the issue should be studied in depth, i.e., which programs meet which needs of which employers and which students?

If further research is warranted, one aspect of that research should be a study of student perceptions as compared to employer perceptions.

* * *

Animal Health Technicians: A Survey of Program Graduates and of Veterinarians. Richard B. Barsaleau and Henry R. Walters. Sacramento: Consumnes River College, March 1977, 16 pp. (ED 136 891)

DESCRIPTIVE ANNOTATION:

Consumnes River College wished to assess the impact of its two-year Animal Health Technician (AHT) program. Two studies were conducted to investigate the employment status and earnings of AHT program graduates: a survey of the graduates and a survey of local veterinarians, the employer group most likely to hire AHT graduates. A question of special interest addressed only to veterinarians asked whether graduates of any accredited AHT programs were "accepted" by the majority of local veterinarians.

At the time of the graduate study, three classes of trainees had been graduated and 68 students had received A.S. degrees. Of these, 47 responded to a mailed questionnaire (a response rate of 69%): 44 were female, 34 were unmarried, and the age range was 20 to over 35 with 34 under 25. Although development of the questionnaire is not discussed nor is the instrument appended, a list of the topics surveyed is provided. Included were employment status, job stability, and earnings. The report included the following findings: 1) 33 or 70% of the respondents were employed as AHTs, 14 or 30% were employed in related fields and one was unemployed by choice; 2) 15 AHTs out of 22 tallied on this issue were spending 25% or less of their time in front-office duties, clerical work as opposed to animal care work. The data are not statistically analyzed.

The second survey was mailed to 139 licensed California veterinarians (most in the Sacramento Valley); 71 responded, yielding a response rate of 51%. Sixty-two of the respondents employed animal health technicians, of whom 27 were graduates of an accredited AHT program, 34 had been trained on the job, 1 trained in a high school Regional Occupational Program, and 5 trained in proprietary schools. The authors state that the practice of on-the-job training is diminishing as more trained AHTs are becoming available. The development of the survey questionnaire is not described nor is the instrument appended, but issues covered by the survey are listed.

Results discussed include the following:

- Thirty-seven responding veterinarians indicated a willingness to provide Work Experience Stations for AHT students.
- From 47 to 60 veterinarians checked training needs in the areas of identification of animal breeds, laboratory techniques, reception procedures, and hospital safety.
- Some respondents commented, "All the Consumnes people I have met seem quite well informed regarding specific practices and their modes of operation" and "The only real problem I have seen is overconfidence which can lead an AHT to give misinformation to a client . . . ."

The study concludes: "Consumnes River College graduates are making their marks and are finding willing employers who will use their training and talents in a legal and ethical manner."

The surveys were an in-house project conducted by the AHT Program Director, R. C. Barsaleau, D.V.M., and H. R. Walters of Career Education/Institutional Research, both of Consumnes River College.

EVALUATIVE COMMENTS:

The major purpose of this study was to determine whether veterinarians in the Sacramento Valley area were accepting graduates of accredited AHT programs. As most graduates of Consumnes River College's program were employed as AHTs and surveyed veterinarians gave a range of positive responses concerning the programs, a degree of acceptance can be inferred. How much is not clear since issues such as possible response bias are not discussed. The study has greater potential than was realized, however, or at least than was reported. Although some responding veterinarians were employing program graduates and others employing technicians who had received their training in other ways, no comparative data are reported.

Because the AHT program is not described, nor is development of the questionnaire described or the instrument appended, results of the study cannot be applied to other AHT programs in other areas nor can the study be replicated from the information given in the report.

* * *

An Assessment of Benefits Derived from Membership in a Vocational Student Organization in the Vocational, Technical and Adult Education System. Dennis R. Collins. Menominee: Center for Vocational, Technical and Adult Education, University of Wisconsin--Stout, August 1977, 92 pp. (ED 145 234)

DESCRIPTIVE ANNOTATION:

The primary purpose of this study was to determine whether participation in vocational student organizations (VSOs) results in leadership ability, career growth, community involvement, and social development on the part of participating students. It was hoped that positive findings would lead to greater emphasis on VSOs in the total spectrum of vocational education curricula. Neither specific research questions nor hypotheses were stated.

Four populations were identified for this study: (1) state directors of vocational education; (2) advisors of VSOs; (3) Wisconsin post-secondary VSO members; and (4) highly participating Wisconsin VSO members. The first two groups were questioned about process and structure variables and so will not be considered further in this annotation. The VSO member sample consisted of 15% of post-secondary members of thirty chapters of VSOs in Wisconsin including the Wisconsin Office Education Association, Distributive Education Clubs of America (DECA), Vocational Industrial Clubs of America, Wisconsin Association of Health Occupations, and Wisconsin Home Economics Related Student Organization. The response rate was 56% of the sample. The sample of highly participating VSO members consisted of 33 DECA members attending the Wisconsin DECA Junior Collegiate Career Development Conference in Madison in March 1976.

Written questionnaires were developed for this study and samples are appended to the document. The questionnaires were mailed to VSO advisors who were instructed to administer them as randomly as possible to 15% of the members. Students used a 5-point Likert-type scale to rate the benefits of VSOs in terms of certain outgrowths:

- leadership characteristics--ability to speak effectively, to make decisions, to exercise creativity
- career growth--pride in work, awareness of job qualifications, understanding of the effects of career choice on life style

- community awareness--involvement in political activity and social affairs of general interest
- social development--teamwork participation, positive self-image, ability to make and keep friends

The data are presented in frequency/percentage tables and in graphs. Data from the highly participating students and the randomly selected students are presented side-by-side for comparison purposes but no statistical analyses of differences have been made. Ratings of four or five (1 = none, 3 = moderate, 5 = significant) were considered to indicate that benefit was derived in terms of the characteristic rated.

Discussion of these findings are included: (1) forty-eight per cent of the participating members gave two leadership characteristics a rating of four or five, and a larger percentage gave such ratings to all other leadership characteristics; and (2) the responses of the randomly selected members were not as favorable as those of the highly participating members, with ratings of four or five being made by only 40-50% of the respondents for most of the leadership characteristics.

The author makes several recommendations for giving greater emphasis and support to vocational student organizations.

This study was conducted by a graduate assistant at the University of Wisconsin--Stout, Center for Vocational, Technical, and Adult Education pursuant to a grant or contract with the Wisconsin Board of Vocational, Technical, and Adult Education.

EVALUATIVE COMMENTS:

Although the stated purpose of this study was to empirically investigate claims regarding the benefits of vocational student organizations, the data collected toward that end were strictly opinions of students. No justification for the assumption that students have the ability to assess and report those benefits accurately was given. Further, since the researcher did not randomly select members, it is not clear that the respondents to the questionnaire constituted a random sample of VSO members. For these reasons alone, it is difficult to come to any conclusions about the "actual" benefits of participation in VSOs.

The rating scale used is positively biased. It is different from most Likert-type scales in that the left endpoint is "none" and every other point is positively defined, whereas the usual scale is symmetrical with two or more negative points, a zero point, and two or more positive points. How respondents interpreted this scale is not clear. Further, although the author interpreted ratings of 4 or 5 to indicate a derived benefit, laws of probability predict that 40% of respondents would indicate a benefit derived (since, given five choices, random selection would result in each choice being selected 20% of the time). The author provides no rationale for his assumption that positive ratings by 48% or more of the respondents is different from chance expectation and for the assumption that it indicates VSOs as effective in leadership development.

The analysis of the data was inadequate. Although the author compares responses of randomly selected members and highly participating members, he uses no statistical techniques to determine whether differences in responses were different from those expected by chance. A statistical analysis such as a chi-square could have been used to advantage. In addition, a more serious problem exists. It is possible that observed differences between the two groups are functions of "self-selection" rather than of intensity of participation in a VSO. It is possible that factors causing students to be highly participating also cause them to develop leadership characteristics or to be better able to. These possibilities are not acknowledged.

* * *

Benefit-Cost Comparison of Vocational Education Programs. Statewide Evaluation of Vocational-Technical Education in Florida--Volume 2. Marshall A Harris. Tallahassee: Florida State University, Florida State Advisory Council on Vocational and Technical Education, 1972, 118 pp. (ED 074 223)

DESCRIPTIVE ANNOTATION:

The general purpose of this study was to determine whether vocational education in Florida has sufficient economic payoff to be considered a favorable medium for investing both public and private (student) resources. Methodologically, it builds on and improves upon two previous cost-effectiveness studies conducted in Florida. Three questions are addressed:

- Do vocational education programs in Florida have positive benefit-cost relationships?
- Do benefit-cost relationships between programs vary and do these relationships vary from student to student?
- Can the results of a benefit-cost analysis be useful to educational planners and decision-makers and to individuals anticipating enrollment in vocational education?

The population included persons who either completed training or left early during the period from August 1968 through September 1971. The state was divided into four geographic regions, and two Area Vocational Centers were selected from each of the regions, with inclusion based on enrollment and program factors. When a random sample of former students had been selected, questionnaires were mailed. Three hundred eighteen usable questionnaires were collected from the 820 mailed, a response rate of 39%. Responses from engineering students were excluded from the study as were those from former students with no training-related job experience. A table indicating numbers of usable returns and reasons for nonusability by vocational programs is provided.

The mailed questionnaire asked 16 general questions as well as specific questions about each job held (title, earnings, etc.). Portions were adapted from a questionnaire developed and used by other researchers.[1] The questionnaire is appended.

Both public and private costs and benefits are analyzed, and technical aspects of the analyses are discussed in the body of the report and in appendices. Chi-squares, Scheffé tests, analysis of variance, and multiple regression are used to analyze the data. A benefit-cost planning model is presented as well.

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[1] Jacob J. Kaufman, Ernst W. Stromsdorfer, Teh-Wei Hu, and Maw Lin Lee. A Cost-Effectiveness Study of Vocational Education: A Comparison of Vocational and Non-Vocational Education in Secondary Schools. Report to the U.S. Office of Education, Washington, D.C., March 1969. University Park: Pennsylvania State University, 1969.

Among the six "most cogent findings and conclusions" discussed are (1) ". . . on the average, society will recoup its average investment of $1,716 per student in 1.3 years and on the average, a student will recoup his average investment of $2,411 in 1.9 years" and (2) "On both public and student investments, nonsecondary students had higher rates of return than did secondary students."

EVALUATIVE COMMENTS:

This report is notable for being very detailed. Cost-benefit analysis is a complex technique, and detail is a necessary prerequisite for accurate assessment. However, a discussion of the pitfalls of this type of analysis can be found in Attachment "C," and findings should be viewed in light of those pitfalls.

A strong point of this study is that a questionnaire in a previous study was adapted. If a knowledge base about vocational education is to be built, some comparability in data collection and analysis are necessary. The repeated administration of the same, or at least similar, instruments is one method of achieving this comparability.

* * *

Comparative Analysis of Post-Secondary Occupational and Educational Outcomes for the High School Class of 1972. F. Reid Creech, Norman E. Freeberg, Donald A. Rock, Kenneth M. Wilson, and Kan-Hua Young. Princeton: Educational Testing Service, May 1977, 465 pp. (ED 139 845)

DESCRIPTIVE ANNOTATION:

This report is the result of a project having two objectives: "to effect a partial evaluation of the effectiveness of vocational education as compared to academic and general high school programs" and "to develop information useful for program-planning specialists involved in vocational education." To accomplish these objectives, various aspects of "the current[2] status and activities of the class of 1972" were investigated, including educational activities, job changes, duration of employment, job satisfaction, and weekly earnings (Chapter 2). Also investigated was "the realization of plans and aspirations" (Chapter 4). Some chapters of the document describe the social makeup of the high school class of 1972, the variables used in the study, and the methods of analysis; others discuss "nonresponse and related concerns" and "Where do we go from here?" The major findings of the study are summarized in Chapter 5.

This study is based on data collected in the National Longitudinal Study of the High School Class of 1972,[3] one of a series of National Longitudinal Studies of Educational Effects sponsored by the Department of Health, Education, and Welfare. Based on both the original set of data and on the first 18-month follow-up, it "represents the first in-depth investigation of what has happened to the Class of 1972 since its graduation, with special emphasis on educational and vocational outcomes."

Nearly 3,000,000 students graduated from high schools across the nation in 1972. About 18,000 of these students were selected, according to a carefully designed and executed sampling plan, to participate in the National Longitudinal Study of the High School Class of 1972.

The development of the first follow-up of questionnaires (FFQ), which was used to collect much of the data discussed in this report, is not described in this document. A form of the questionnaire is appended however and the questionnaire items are discussed. Nonresponse and related concerns are also discussed.

The data analysis techniques employed in this study are thoroughly described. Multiple point-biserial regression analysis was used for comparisons between two groups, and multiple discriminant analysis was used for comparisons involving three or more groups. An econometric model using a simultaneous two-equation system was used to examine the interaction between college attendance and work participation. Five structural (path) analytical models were built and tested in an effort to assess what underlies decision making in the occupational-educational aspiration area, post-high school educational progress.

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[2] The time period referred to as current roughly represents May 1972 - January 1974.

[3] See the appendix of Key Related Literature for a citation and annotation of this study.

Among the results discussed in the "Summary of Major Findings" are these:

- At the time of the first follow-up survey, 64% were employed and 8% were out of work.
- The employment rates for graduates of various curricula were vocational: 77%; general: 68%; and academic: 56%.
- The homemaking rates were vocational: 40%; general: 36%; and academic: 15%.
- Earnings were similar for blacks and whites but much higher for males than for females.
- On the average, vocational graduates worked a greater number of weeks from October 1972 to October 1973 than did graduates of other curricula.

The project investigators were from the staff of Educational Testing Service. The project was conducted pursuant to HEW Office of Planning, Budgeting, and Evaluation Contract No. 300-75-0312, a response to Office of Education RFP 75-60.

EVALUATIVE COMMENTS:

Time and space do not permit a thorough analysis of this document. It is notable in that the variables and methods of analysis are described in detail; however, the reader is cautioned to thoroughly review both this document and other documents describing the National Longitudinal Study of the Class of 1972 before accepting any of the results listed here.

* * *

A Comparative Study of the Occupational Achievement of Vocational and Non-Vocational High School Graduates in the State of Arkansas. Dean C. Andrews and Lawrence H. Roberts. Magnolia: Educational Planning and Evaluation Services, December 20, 1974, 131 pp. (ED 112 207)

DESCRIPTIVE ANNOTATION:

This study was a response to the concerns of taxpayers and decision-makers in regard to the effectiveness of education. Specifically, it was conducted to acquire feedback information to be used in improving the vocational education programs in Arkansas. A cost-benefit study was considered but rejected because, among other reasons, the cost would have been prohibitive and too many methodological issues are yet to be refined. Instead, this study sought to compare the occupational achievements of students who were enrolled in vocational education with those of students who were not so enrolled with respect to their (1) occupational status, (2) educational status, (3) earnings, (4) job satisfaction, and (5) other related factors.

The study, conducted in 1974, had as its population the 1970 graduating classes of eight Arkansas public high schools. Three samples were selected: (1) those who had had two semesters of vocational classes; (2) those who had had four semesters of vocational classes; and (3) those who had had no vocational training. In order to ensure that the third group was comparable to the first two, those graduates who had had grade point averages (GPAs) above 2.25 and had planned to go to college were eliminated. A total of 1749 of the 2597 graduates of the eight schools were sent questionnaires yielding an overall sample of 67%. Three mailings were used in an attempt to reach as many graduates as possible; the final response rate was 36% of the sample (24% of the population). Tables indicating responses to the separate mailings and response rates by sex, race, GPA, and vocational training are provided.

A preliminary questionnaire was developed and pilot-tested for clarity and reading level with eleven 1973 graduates of one of the high schools used in the study. Those graduates made suggestions that were incorporated into a revised form subsequently administered to five more graduates. In addition, several professional educators critiqued the preliminary questionnaire. A copy of the final form is provided in an appendix. The data from school records and the questionnaires were summarized on pre-designed tables and coded on computer cards. Most of the data analysis is descriptive--summary tabulations of frequencies and percentages. Chi-square analyses were used to determine whether statistically significant differences existed between categories.

Topics discussed in three chapters include the occupational activities of the vocational graduates, the vocational graduates' evaluation of their training, and a comparison of occupational achievement of the four-semester vocational graduates and the nonvocational graduates. A subsequent chapter summarizes the results and provides conclusions and recommendations.

Chi-square analyses were done to compare the vocational and nonvocational groups on the basis of sexual composition, racial composition, and grade point average. The only statistically significant difference between the groups was in grades: a higher proportion of vocational graduates had GPAs above 2.00. The authors acknowledge that the results reported, of which the following are a sample, should be interpreted in light of this grade difference:

- There are no significant differences in occupational status between graduates of each group (i.e., no significant difference in proportions of those working full-time, of those attending college, etc.).
- A greater proportion of vocational graduates are employed in trade and industrial areas.
- There are no significant differences in the degree of job satisfaction expressed by the vocational and nonvocational graduates.
- There are no statistically significant differences in earnings.

Based on differences in occupational status between vocational students with two semesters of vocational courses and those with four semesters, the authors conclude that two years of vocational training is desirable for those who plan to work after high school. Based on the lack of relationship between type of job and type of training, however, they recommend that local education agencies study the relationships of their offerings to the job market and/or implement a vigorous placement program. Still, they conclude, vocational graduates have a greater chance than nonvocational graduates of finding full-time work they consider closely related to their high school training.

This study was conducted by two members of "Educational Planning and Evaluation Services," based in Magnolia, Arkansas.

EVALUATIVE COMMENTS:

This study is notable for at least three reasons:

- The authors indicate that they chose a methodology in light of their purpose.
- The data-collection instrument was pilot-tested.
- Differences between groups were statistically analyzed.

Because graduates who had four semesters of vocational training had a higher occupational status than those with only two semesters, the authors conclude that four semesters are better than two. They failed, however, to consider the possibility of a self-selection factor: Perhaps those students who completed four semesters have other qualities helping them achieve a higher occupational status than those with only two semesters. There are a number of ways this question can be explored in further research.

* * *

A Comparative Study of the Occupational Achievement of Vocational and Non-Vocational High School Graduates in Texas. John A. Laska and Jau-Woei Chiou. Austin: Department of Cultural Foundations of Education, Center for International Education, University of Texas at Austin, June 30, 1973, 183 pp. (ED 118 944)

DESCRIPTIVE ANNOTATION:

The primary purpose of this study was "to determine whether there were any real differences in occupational achievement between the high school graduates who had been enrolled in vocational education programs and the graduates who had not been enrolled in these programs." It was intended to respond to the "legitimate right [of concerned and interested taxpayers, legislators, and political leaders] to inquire about the efficacy of . . . large expenditures in preparing students for gainful employment in the labor market." Further, the findings of this empirical research were intended to be used for continuing improvement of vocational education programs.

The literature review section cites the Little review[4] as well as some specific studies. "In summary, a review of existing research indicates that earnings, length of employment, job satisfaction, occupational status, and occupational mobility were commonly used as the indices of occupational achievement. Some other variables were found relevant in accounting for these indices of occupational achievement. They were sex, ethnicity, academic achievement, social origin, college attendance, community differences, and vocational education. The findings obtained from existing research were extremely useful in developing the conceptions and in deciding the scope of this study."

For this study, vocational students were defined as those who had completed two credits in a school year in a vocational program. Non-vocational students were matched to vocational students according to sex and accumulated scholastic ranking. Complete information on the sampling procedure is provided. The population consisted of students who had graduated in 1970 from 17 public high schools in 5 independent Texas school districts. A letter and questionnaire were sent to 3,045 graduates in August 1972. Follow-up mailing was sent in September. In all, 1058 (35%) of the 3,045 graduates responded to the questionnaire, 502 (16%) could not be reached, and 1485 (49%) either indicated a refusal to cooperate or did not return the questionnaire by the October deadline. Response rates by schools are tabled as are characteristics of the sample.

A survey questionnaire was designed to collect data from which to derive six indices of occupational achievements. Three indices concerned income--accumulated income, monthly earnings, and hourly rate--and three concerned employment--weekly working hours, months of employment, and actual job length. In order to account for possible spurious, but statistically significant, relationships, several control variables were introduced, including sex, community, ethnicity, social origin, marital status, college attendance, and academic achievement. Other possibly relevant variables, such as quality of teaching personnel, teaching facilities, work motivation, personality traits, and labor-market situations, were deemed beyond the scope of this study.

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[4] J. Kenneth Little. Review and Synthesis of Research on the Placement and Follow-up of Vocational Education Students. See the Appendix of Key Related Literature.

The questionnaire was pilot-tested extensively to ensure that it was comprehensible. Item analyses were performed to eliminate redundant items. The survey questionnaire is appended as are coded raw data.

The two major statistical techniques used in this study are analysis of variance and multiple regression analysis. Factor analysis is used to interpret the interrrelationships among different indices of occupational achievement. The rationale for each specific analysis used is thoroughly discussed and several tables of data are provided. Results of preliminary analysis and subsequent analyses are thoroughly discussed with accompanying tables.

Among the conclusions and policy implications (based on 894 respondents) provided in the final chapter are these:

- 244 completed two or more years of college, and 157 attended college from 4 to 18 months during the 27 months after high school graduation. For those students then working, secondary vocational education was not an important variable in initial employment when community, sex, and college attendance were controlled.
- The effects of secondary vocational education were statistically significant (.05 level or beyond) in accounting for the accumulated income and actual job length of the 493 non-college workers of both sexes, the months of employment of male non-college workers, and the weekly working hours of female non-college workers in the Austin-San Antonio area, but not in Houston.
- Community factors seemed to relate to the operation of secondary vocational education in different ways.
- Beneficial returns of secondary vocational education were definitely real and substantive in terms of yearly accumulation.

The researchers are members of the Department of Cultural Foundations of Education, Center for International Education, University of Texas at Austin. The study was conducted pursuant to a contract with the Department of Occupational Education and Technology of the Texas Education Agency.

EVALUATIVE COMMENTS:

This is a complex study with several notable features. Rationale, based in part on a literature review, for the chosen variables was provided; the survey instrument was pilot-tested; the data analyses are thoroughly described; and the raw data are appended to the report. It is one of the few studies in which vocational students are compared to non-vocational students. The students were matched according to sex and scholastic ranking. However, the authors do not acknowledge the limitations of matching as a tool in quasi-experimental research.

* * *

The Contributions of Vocational Education, Training, and Work Experience to the Early Career Achievements of Young Men. John T. Grasso. Doctoral dissertation presented to the Faculty of Educational Development of The Ohio State University, Columbus, July 1975, 167 pp. (ED 113 537)

DESCRIPTIVE ANNOTATION:

The author states "Much of the decision making underlying vocational education legislation and expenditures occurred in the absence of adequate information." He goes on to say that although research has been done and some of it is encouraging in its diversity of perspectives, the policy relevance of the research "has been circumscribed by limitations inherent in the design of many of the studies, or as a result of conceptual or methodological difficulties, often compounded--if not caused--by a lack of adequate data." Other limitations are discussed as well.

This study was conducted to contribute to "improvement in the formulation of public policy on the education and training of youth . . . by reviewing completed research and by extending and refining it with both improved data and methods of analysis." The empirical aspect of the study seeks to determine how youth from different high school programs compare in the following areas:

- knowledge of occupations

- attitudes toward the adequacy of their preparation for work
- participation in post-school training and learning activities
- skill level
- wages earned
- job satisfaction
- unemployment experience
- long-run career prospects

Except when noted, the conclusions drawn in this study are based on a subset of the National Longitudinal Surveys[5] (NLS) sample: those young men not enrolled in school at the time in question who had completed high school but not even a year of college. "A national probability sample of over 5,000 males between the ages of 14 and 24 was interviewed in the last quarter of calendar year 1966 and annually thereafter through 1971; information collected through 1969 was available for this study." The young men were divided into four curricular categories: college preparatory, general, vocational-commercial, and vocational-other (referred to as vocational).

This study is based on the personal interviews and the 1968 special mail survey conducted as part of the National Longitudinal Surveys. The instrumentation is described in various NLS documents. All analyses in the study are based on data statistically weighted to allow reliable comparisons between black and white youth. Further delimitation of the youth on the bases of vocational program studies or extent of study were not possible; however, it was possible to statistically control for the following demographic variables: socioeconomic status, scholastic aptitude, and race. Other control variables used are price level and demand, military service, residence at age 14 (rural farm, rural non-farm, small city, medium city, and large city or suburb), and, for the in-school youth analyses, grade placement and work experience (if any). All the variables used, independent and dependent, are thoroughly described.

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[5] See the Appendix of Key Related Literature for information about the National Longitudinal Surveys.

The results relative to the eight factors itemized in the first paragraph of this annotation are described in detail with several summary tables. The following are included among the findings:

- Neither vocational nor vocational-commerical students possess greater occupational information than general track students.
- Vocational graduates do not consider themselves better prepared for the world of work than general graduates.
- Many graduates of the various curricula sought further training--college, preprofessional or technical; commercial, managerial; vocational, skilled manual.
- There is no indication that vocational graduates obtain jobs with higher skill requirements than other graduates, but those with post-high school training (excluding college) obtain jobs with higher ratings.
- In terms of wages, white vocational students benefit more from post-high school training (excluding college) than other white students. However, there were no wage differences found among black youth from different curricula.
- Job satisfaction results reflect the earnings results reported in the preceding item for white youths, but again no curricular differences were found among black youth.
- No conclusions on unemployment experience with respect to curricular differences could be drawn from the data.
- College preparatory students and white commercial graduates have the most favorable long-run career prospects, in terms of earnings; however, among black youth, the positive differential for college preparatory students may be nonsignificant.

The final chapter presents conclusions and policy implications derived from the study. There are at least four major implications for secondary school policy makers:

- Schools need to impart more information regarding careers in general and about the role and importance of postsecondary school training and learning opportunities.
- The accessibility of postsecondary training programs should be increased.
- Additional training for black youth must be promoted, but efforts must be accompanied by affirmative action labor-market policies.
- Specific types of careers best served by each curriculum should be ascertained and programs modified accordingly to serve the needs of youth and society.

This study was undertaken, in part, to fulfill requirements for the author's doctoral degree. He spent five years working on the National Longitudinal Surveys project while completing his doctoral studies.

EVALUATIVE COMMENTS:

Several limitations of the curriculum variable are acknowledged by the author. Occupational programs, for example, auto mechanics and agriculture, are not distinguished; student reports of their curricula were not confirmed; the extent or intensity of vocational study undertaken in high school was not noted; and students who took a "general" curriculum with a practical arts emphasis (for example, general business courses) are not distinguished from those who took a general curriculum without such emphasis. In spite of its limitations, however, this study with its statistical controls of several variables is an improvement over several less sophisticated studies.

* * *

A Decade of Feedback Information from Harcum Graduates: 1968-1977. Boris Blai, Jr. Bryn Mawr, Penn.: Harcum Junior College, August 1977, 5 pp. (ED 142 270)

DESCRIPTIVE ANNOTATION:

The overall purpose of Harcum Junior College's Institutional Research Reports is to provide information for "effecting improvements in existing practices." This document is a report of their self-evaluation program, on-going since academic year 1967-68, designed in consonance with Harvard professor David Reisman's statement ". . . a college must be tested by its products, the most obvious product being the alumni." Specifically addressed is the extent to which the College has achieved its objectives "[to] provide transfer programs paralleling those offered in the first two years of four-year collegiate programs of study," and "[to] offer career preparation, equipping individuals to become contributing members of the working world."

From 1968 through 1977, a questionnaire was mailed each summer to that year's graduates. The average response rate was 52%. Although the questionnaire was not discussed, this report summarizes the data collected over that decade.

Among the results presented are these:

- The lowest percentage of those accepted for transfer to advanced standing was 30% in 1976; the highest, 62% in 1973.
- The lowest percentage receiving full-time employment was 20% in 1973; the highest, 52% in 1969.
- In response to the statement ". . . Harcum prepared me for the field I have chosen," 89% responded "very helpful" or "somewhat helpful"; only 11%, "not helpful."

Among the interpretive comments made by the author are: "One reason for the decreasing trend in transfer to four-year colleges/universities may be that more Harcum graduates are entering occupational fields that do not require baccalaureate preparation," and "Some graduates do not look for work until the fall following graduation, and therefore the percentages reported are conservative estimates of the employment status of Harcum graduates." The general conclusion of this decade report is "the articulation of its graduates into the community at large . . . [evidences] a record of effective results."

This report was written by the Director of the Harcum Junior College Office of Institutional Research.

EVALUATIVE COMMENTS:

This is a very brief report, meant for internal use at the college. As such, it provides policy makers and staff with a descriptive overview of some outcomes of Harcum's blend of liberal arts and an occupational program. However, the report gives the reader insufficient information for judging the credibility of the data. Was the questionnaire valid and reliable? What was the extent of the nonresponse bias?

A further problem is that no standards are provided against which to compare the reported percentages. How is a finding that 11% of respondents found the college to be "not helpful" in preparing them for their chosen fields useful to policy makers? Is that percentage so small as to be not worth considering or so large as to challenge the college to initiate changes aimed at improving its occupational preparation programs? If it is not useful information, one may question the inclusion of the question in an evaluation study.

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The Effectiveness of Vocational and Technical Programs: A National Follow-up Survey. Gerald G. Somers, in collaboration with Laure M. Sharp and Thelma Myint and with the assistance of Susan Fernbach Meives. Madison: Center for Studies in Vocational and Technical Education, University of Wisconsin, 1971, 282 pp. (ED 055 190)

DESCRIPTIVE ANNOTATION:

The basic purpose of this study was to provide some measures of the effectiveness of vocational-technical education, that is, formal instruction aimed at preparing youth and/or adults for initial entrance into an occupation or for advancement within an occupation (excluding advancement for which baccalaureate or post-baccalaureate education is a prerequisite).

At the time of the study there were no national data available for an evaluation of the effectiveness of vocational education; thus the study was undertaken to fill that void.

The universe, the sampling techniques, the study samples, and non-response bias are thoroughly described and several tables are included. Basically, a stratified random sampling technique was used, resulting in samples of graduates from high school vocational programs; graduates from postsecondary vocational schools (presumably vocational-technical institutes); graduates from vocational programs of junior colleges;[6] graduates of high school academic programs; and dropouts from high schools, postsecondary schools, and junior colleges.

Samples of 1966 graduates were surveyed by mail in 1969. Questionnaires were mailed to 7327 graduates of 194 secondary schools, 3461 graduates of 54 postsecondary schools, and 2591 graduates of 64 junior colleges. The samples of dropouts obtained were too small to include in most of the evaluative analyses, but some descriptive data are provided.

A random sample of non-respondents was drawn and follow-up telephone interviews were conducted so non-response bias could be assessed. There did not appear to be any consistent, significant differences; however, it is noted that the respondents and sampled non-respondents are not evenly distributed among the program areas.

The development of the mailed questionnaires is not discussed; they are appended, however. The questionnaires had from 47 to 70 questions, with multiple-choice and open-ended items. The data analysis consisted of cross-tabulations of percentages, chi-squares, and regression analyses.

Findings of the study are discussed in six chapters:

- The Educational Experience and Student Attitudes
- Post-Vocational Employment Experience
- Post-Vocational Wages and Earnings

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[6] It is not clear whether community colleges are included, but the author cites a report prepared by the Bureau of Social Science Research giving details on characteristics of included junior colleges.

- Post-Vocational Educational Experience
- Evaluation of the Costs and Benefits of Vocational Education
- Conclusions and Policy Implications

Several tables are provided throughout the chapters and in an appendix. Seven "highlights" are provided in the front matter of the document, and each chapter has a summary conclusion.

Conclusions and policy implications, in the form of a discussion of the significance of school level, geographic region, urban vs. rural setting, program area, demographic characteristics, and grade point averages as influences on attitudes, labor market performance, and further educational experience are presented in the final chapter.

Several summary observations are included with their implications:

- Vocational programs at different school levels serve different clientele (because of variances in student backgrounds and attitudes) and different training purposes, despite similarity in occupational program titles.
- A relatively large proportion of junior college agricultural, technical, and health program graduates and high school distributive and trade and industry graduates move directly from graduation to a full-time job or further education, whereas graduates of other programs require longer job-search times.
- Junior college vocational graduates in general experience greater economic success with more satisfactory employment and better earnings than other graduates, both vocational and academic.[7]
- With the exception of agricultural programs, economic benefits of vocational and technical education are higher for graduates in the West,

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[7] The authors acknowledge that not all junior college programs are cost-effective; that the cost data used are from other studies; and that junior college programs are not necessarily the best choice for every student because of variance in interest, intelligence, and other qualifications.

Northeast, and North Central than in the South; and higher for urban and suburban graduates than for rural graduates.

- Males, older graduates, and married graduates enjoyed labor market experience superior to those of females, younger graduates and unmarried graduates; one implication is that there is need for a longer period of general education preceding specific vocational choices.
- The relation of job to training does not appear to influence levels of employment and earnings: actually many students are able to earn more by moving out of their field of training upon labor-market entry.
- This may support the view that general vocational training and training for clusters of job skills are preferable to specific training and training for specific jobs.
- Although occupational program area is of some importance in the labor market experience of graduates, it is not as important as traditionally believed.

This research was funded by the Division of Adult and Vocational Research, U. S. Office of Education, Department of Health, Education, and Welfare. The senior author is a professor at the University of Wisconsin; his collaborators are staff of the Bureau of Social Science Research, and the junior author is a graduate research assistant at the University of Wisconsin.

EVALUATIVE COMMENTS:

This study is too complex to permit a thorough critique. The authors acknowledge some limitations of the data collected and the data available, as well as noting that, in many instances, data are unavailable to distinguish among alternative reasons for some findings. For example, did women as a whole earn less because of overt discrimination or because they did not aspire to full-time jobs following their vocational training?

Although the report is lengthy, some information necessary for assessing the study and relating its findings to other studies is lacking. For example, what exactly is a graduate of a postsecondary vocational school? What specific methods of statistical analysis were used? How was the questionnaire developed?

* * *

Employer Satisfaction with the Skills of Vocational Education Graduates in North Dakota. Larry L. Smiley. Grand Forks: Bureau of Educational Research and Services, University of North Dakota, August 1976, 81 pp.

DESCRIPTIVE ANNOTATION:

One of the goals of North Dakota's State Plan for Vocational Education specifies the percentage of completers who will be placed in the field in which they have been trained, or in a related field. This study was done to aid that effort by ascertaining how satisfied employers were with the completers they had hired and in what areas the vocational programs needed to be improved.

The initial data base comprised all secondary and postsecondary sites in North Dakota with at least five vocational programs. Personnel in each program identified three major employers of program graduates and one or two self-employed graduates. The 482 names identified constituted the survey sample. From 226 employers indicating a willingness to participate in a personal interview, 191 provided data. A questionnaire (appended to the document) was developed for use in the personal interview, which took approximately 30 minutes.

Twenty-one questions were asked, several with multiple parts. Some of the questions were in a rating-scale format, some in the form of checklists, and others open-ended or requiring a yes or no response. They addressed issues of general satisfaction with employees; degree of specific knowledge, skills, and abilities employees possessed; and ways of improving training.

Findings are presented in the order that questions appear on the interview schedule. Responses to each question are summarized in tabular form along with a brief discussion. It is left to the reader to draw conclusions. The reported findings include the following:

- Fewer than five per cent of the responding employers rated the vocational education system below average.
- 73% of employers rated manual job skills above average and 47% ascribed the same rating to practical job knowledge.
- A specific employer comment is "Most of the vocational education graduates come to work with skills well developed, but the training programs have failed to offer the students anything that prepares them for moving into supervisory or managerial positions."
- Nearly 90% of the employers rated the vocationally trained employee high to average in comparison with those without the vocational training. Many could not make a comparison because certification requirements for entry-level job placement prevented a non-vocationally trained individual from being hired.
- Several "needed areas of improvement for job applicants" were listed. Heading the list (in order of frequency of response) were attitudes toward work and appearance. Also listed were courses that vocationally trained students should have, with courses in Communication, Speaking Effectively, and Work Orientation at the head of the list. Need for a course in Success in Marriage was listed by 88% of the respondents.
- Many employers contact schools to recruit qualified employees. Some (including out-of-state) schools are regularly contacted because such individual schools have gained a reputation for quality--good skill development, etc.
- A list of some of the general comments employers made about vocational education programs and

the graduates is provided. Among the comments are: "Realities of position need to be made clear to the students," and "Secretaries trained as medical secretaries are less capable than those with no specialized training."

- Several employers expressed the opinion that high school graduates are sold a bill of goods when told they have a saleable skill after their high school vocational training, that the intent of high school vocational training is to introduce young people to vocational areas and materials of those trades, not in any sense to provide a terminal degree. One employer said, "If this high school level training has helped a young person to clarify vocational interest which can be furthered by additional schooling, it has served an excellent purpose."

EVALUATIVE COMMENTS:

This type of study can alert vocational planners to employers' perceptions of vocational education, thus indicating areas where the system is meeting their needs, where improvements are needed, and what kinds of changes may prove beneficial. It gives direction for more intensive investigation. A careful reading of the report is necessary, however, because in some instances the author notes that respondents' verbal comments contradict the ratings. For example, employers' ratings of students' attitudes toward work do not indicate that this is a serious problem, whereas employers' comments indicate that it is.

It is unfortunate that the findings are not broken down by level of schooling (secondary vs. postsecondary) and that information about the content of the various vocational curricula was not compiled. Although this study was not intended to be generalized to programs outside North Dakota, such information would be helpful to those who might wish to use the study to suggest areas for further exploration within their own systems.

* * *

"A Follow-up Study of Former Occupational-Technical Students at Virginia Community Colleges." Edith H. Carter. Paper presented at the Annual Regional Research Conference for Secondary and Post-Secondary Vocational Education Personnel, April 17, 1976, 10 pp. (ED 136 899)

DESCRIPTIVE ANNOTATION:

It is stated in this report "The planning for expansion of program operation should be based upon awareness of information about students and potential students, their occupational needs, and also the activities of former students after they leave the community college." This study was designed and conducted to provide comprehensive and accurate information about former students of Virginia community college occupational-technical programs. Explicit, major objectives of the study were as follows:

- To identify selected personal and demographic characteristics of former students in occupational-technical programs
- To identify post-college activities of former students
- To study the attitudes of former students toward their community college experience and current employment
- To study patterns of student retention and withdrawal
- To examine differences among graduates and non-graduates and among the several types of graduates in terms of their characteristics, post-college activities, and personal evaluations of college experience and employment

The population consisted of all students who had been enrolled in a Virginia Community College occupational curriculum at any time from the fall of 1966 through the fall of 1969. A total of 11,623 former students from 13 colleges were identified. After an initial questionnaire and three follow-ups were mailed, 61% of the population (not including the 12% undeliverable) returned usable responses (73% of the graduates and 56% of the non-graduates).

Two instruments were used to collect data: The "college data form" was used to collect demographic information and the "student questionnaire" was used to collect information about post-college activities, employment, and evaluation of college experiences. The student questionnaire was designed to fulfill the stated objectives of the study, but no further discussion of its development is provided, nor is it appended.

Responses to the questionnaire were entered onto computer tapes by optical scanning to obviate the possibility of keypunch errors. No statistical analyses of the data are reported.

Two results reported are (1) that almost three-fourths of the [respondents] were working full-time in jobs related to their community college curricula and (2) that both graduates and non-graduates rated the quality of their college preparation superior or good in most areas with nine-tenths of them stating that they would recommend their community college to an individual planning to enroll in the same program.

This study was conducted/reported by the Director of the Office of Institutional Research, New River Community College.

EVALUATIVE COMMENTS:

This report is necessarily brief, because it was a conference paper rather than a final report of a study. Still, the credibility would be enhanced if more complete analyses of the data were presented. The relatively large response rate reported may be indicative of the advantage of follow-up mailings.

As in most of the studies annotated in this bibliography, there is some question regarding the validity of the survey instrument. For example, what assurance is there that former students who respond to a questionnaire from their alma mater, when asked if they would recommend it to other individuals, will respond honestly after thoughtful consideration? A pilot-test in which respondents are questioned more thoroughly in a personal interview (and asked, for example, if they ever have recommended their college to another individual) is one way to assess the validity of the survey instrument.

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A Follow-up Study of Illinois Home Economics Job Training Programs. Final Report. Kathleen M. Howell and Joyce L. Felstehausen. Springfield: State of Illinois, Board of Vocational Education and Rehabilitation, Division of Vocational and Technical Education, Research and Development Unit, September 1971, 122 pp. (ED 059 379)

DESCRIPTIVE ANNOTATION:

This pilot study was designed to test the use of certain procedures and instruments for examining the post-high school employment experiences of graduates of Illinois Home Economics Cooperative Education Programs and to provide recommendations for leaders in the field. Both graduates and employers were surveyed. Questions asked on the graduate questionnaire concerned type and number of jobs held, reasons for leaving jobs, desirable and undesirable features of jobs, part- or full-time status, reasons for never being employed, and the value of the job training received. The employer/supervisor questionnaire asked how well the graduate was prepared for the job, how proficient the graduate was in important job-entry skills, and how the job training for that position could be improved. Both questionnaires included multiple-choice and open-ended questions.

Cooperative Gainful Home Economics teachers in 44 Illinois public secondary schools identified 691 home economics graduates of 1969 and 1970. The sample analyzed consisted of 188 respondents, a response rate of 27% (with non-deliverables assumed to be random, a response rate of 34%). Those graduates identified 110 employers of whom 75 returned questionnaires, yielding a response rate of 68%.

Both the graduate and the employer questionnaires were adapted from others developed and used previously by the senior author. After pilot testing for use in this study, revisions were made. The questionnaires are appended.

The results were tabulated according to sex, graduation year, and courses taken. Tables of frequencies, averages, and percentages are provided, but no further statistical analyses were made.

The following findings from the graduate questionnaire were included:

- 62% of the graduate sample were employed at the time of the study.

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- 24% to 55% of those employed (varying with training area) were employed in their areas of training.

- 11% of the graduates had never been employed.

- 51% of the graduates indicated job satisfaction related to working with people, whereas 54% indicated dissatisfaction related to job-situation factors, such as specific undesirable tasks and working conditions.

- Graduates felt that, although they would have liked more employment experiences and instruction, their vocational programs had prepared them for employment, especially in getting along with others, using time and energy, and handling new or unpleasant situations.

Following are some of the findings from the employer/ supervisor questionnaire reported:

- Job training contributed to employability traits, especially in areas of attendance, attitudes toward supervision, and cooperativeness.

- Personal factors such as initiative and honesty were entry-level skills considered important.

- Training should emphasize positive attitudes toward work, learning, and supervision.

Specific recommendations are made for the Program Approval and Evaluation Unit, the Special Programs Unit, and the Research and Development Unit. These range from recommendations that specific steps to implement the provisions of the State Plan be identified to suggestions that a comprehensive evaluation program include long-range investigations to determine relationships between crime and delinquency rates and job training (or lack thereof) for youth.

Both authors are from the Eastern Illinois University's School of Home Economics. The senior author, project director, is an Associate Professor whereas the junior author, principal investigator, is a research assistant. The study was conducted pursuant to a contract with the Illinois Board of Vocational Education and Rehabilitation.

EVALUATIVE COMMENTS:

The authors themselves question the validity of their results, since only 34% of the graduates who received questionnaires responded. They express concern that 35% of the mailed questionnaires were undeliverable by the post office, indicating lack of current address information even though follow-up is mandated.

One of the notable features of this study is its pilot test and appended questionnaire. Reliability and validity data are not given but it is noted that some item analysis has been done, indicating that the instruments will be refined for still further use.

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Follow-up Study of Machine Tool Technology and Building Construction Graduates: Evaluation Report. Wilbur Hall, Rodney Gray, and Arthur O. Berry. South Portland: Southern Maine Vocational Technical Institute, August 1975, 115 pp. (ED 124 746)

DESCRIPTIVE ANNOTATION:

This study was designed to determine how well the Southern Maine Vocational Technical Institute's Machine Tool Technology (MTT) and Building Construction (BC) programs are succeeding in their efforts to prepare well-qualified employees. Specifically, it sought to acquire the following information: (1) employment status of graduates, (2) employment sequence of graduates, (3) perceptions of the value of the MTT and BC programs held by graduates and employers, (4) up-grading and retraining needs, and (5) graduate and employer profiles for programmatic restructuring and development.

A questionnaire was sent to each of the 126 MTT and BC students from the classes of 1970, 1972, and 1974. A random sample of those graduates living within a reasonable commuting distance of Southern Maine Vocational Technical Institute were selected for personal interviews to supplement the questionnaire. Seventy-five graduates returned questionnaires and 38 of them were interviewed. Employers were interviewed when possible. The response rate was 63% for BC graduates and 55% for MTT graduates. A majority of the sample had received diplomas; the others, associate degrees.

The questionnaire, consisting of an "opinionnaire" and a checklist, was validated by use with a sample of graduates before being sent to the selected sample. Although personal information (name and address) was collected, graduates were assured that their responses would be kept confidential. The opinionnaire and checklist are appended.

The document provides extensive tables detailing responses to the survey instruments. Responses to many of the open-ended questions are listed as well. Results, in terms of percentages, are reported separately for MTT graduates and BC graduates, although no statistical analysis is provided.

Among twenty summary findings are the following:

- All graduates who responded were employed, with a majority working in the trade area for which they had been prepared or in one closely related to it.
- The majority had held only one job since graduation.
- 38.6% of the BC graduates and 65.7% of the MTT graduates had pursued further training or education.
- Respondents indicated general satisfaction with the quality of the instruction they had received, although attaching many suggestions for improvement in the curricula.
- Employers were generally satisfied with program graduates, although they were concerned "with continued program relevancy to the trade or occupational areas." Recommendations for program and study improvement are provided.

This study was initiated by the Southern Maine Vocational Technical Institute. The principal investigators were instructors at the Institute--one BC, the other MTT--employed full time for two months to conduct the study. Dr. Arthur O. Berry, whose professional identity is not reported, was responsible for the data analysis and the evaluation report.

EVALUATIVE COMMENTS:

The report gives sufficient information for replicating the procedures of the study. However, other information is lacking: The interview questions for the graduates and the employers are not described; although it is stated that the questionnaire was validated, the validation procedure and results are not described; although the 100% employment rate of the respondents suggests a tendency for bias toward the employed, possible bias in the respondents is not considered; and finally, statistical analysis of the data was not done.

Although these insufficiencies may have minor impact for the intended audience--Southern Maine may conclude that their Vocational Technical Institute is doing a reasonable job of preparing well-qualified employees--it is injudicious for an expanded audience to draw any conclusions from this report, or even to determine whether the survey instrument would be useful for another institution. Without even minimal statistical data analysis to determine the probability of random differences in responses, on the basis of this survey it is risky even for Southern Maine to draw any substantive conclusions about policy or program changes needed.

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Follow-up Study of 1969-1975 Graduates of the Division of Technology of New York City Community Colleges. Jeanne M. Gammel, Stanley M. Brodsky, and Richard L. Alfred. Brooklyn: New York City Community College, April 1976, 134 pp. (ED 121 396)

DESCRIPTIVE ANNOTATION:

The preface to this study states, "If the college of the future is to realize even a modicum of its potential, faculty and administrators will have to begin to pay as much attention to the outputs of instructional programs as to the number of students, buildings, and organizational structures," The study was designed to provide such output information in terms of career patterns, perceptions of curricula, and attitudes toward work and further education held by graduates of twelve curricula of the Division of Engineering Technology at New

York City Community College (NYCCC). The results were intended to be used not only internally but also externally to provide agencies with information regarding contributions made by the college to business and industry.

The 2,534 students graduating over the seven-year period from 1969 through 1975 constituted the population. In the fall of 1975, a questionnaire was mailed to 2,087 of those graduates, though the method of selecting the sample is not stated (perhaps mailing addresses were not available for the rest of the population). Nine hundred twenty-two graduates returned usable responses, yielding an overall response rate of 44%. A table lists the number of graduates by curriculum and graduation year and also indicates respective response rates.

The development of the questionnaire is not discussed, nor is reliability and validity information provided; however, the instrument is appended. The questions asked were designed to collect data on the following variables: (1) present occupational status; (2) field retention of employed graduates; (3) proportions in senior, supervisory, managerial, or professional positions; (4) change of employers and job titles between first and present jobs; (5) further college attendance; (6) further degrees sought or completed; (7) perceptions of the NYCCC curricula; and (8) other variables related to employment and further education.

The resulting data for each dependent variable are presented in two-dimensional frequency/percentage tables of graduation year by curriculum. Summary results from fourteen earlier follow-up studies are presented for comparison. No statistical analyses were done. The authors point out that results of this study cannot be considered positive or negative because standards for success have not been established. For example, no one has determined how many students should be employed in training-related fields or what percentage of students should continue their education.

The results of the study are discussed in detail and hypotheses are suggested to explain differences in graduates of various years and curricula. Among the results discussed, the following are included:

- 77% of the graduates are employed, 14% are full-time students, 9% are unemployed, and 1% are in the military service or retired.
- Of the unemployed 1974 and 1975 graduates, most are students, whereas few of the unemployed 1969-1971 graduates are students.

- The proportion of employed graduates by curriculum area varies from 47% for architectural technology to 96% for fire-protection technology.

- Of the 607 graduates employed in training-related jobs, 44% have senior, supervisory, managerial, or professional positions.

- Of all employed graduate respondents, 27% found their education extremely helpful in performing their present job, 38% fairly helpful, 24% slightly helpful, and 11% not at all helpful.

- 61% of the respondents attended college after graduation from NYCCC, ranging from 58% for the class of 1974 to 68% for the class of 1971. To summarize the findings, graduates of each curriculum are described in "modal student profiles."

Although the study was clearly done internally, both by and for college staff, the researchers were not identified.

EVALUATIVE COMMENTS:

This study was well thought out and is one of the few in which the particular data collected can be traced to an overall purpose. It is quite possible that one fault is an omission in reporting rather than in the study itself: Although information from fourteen previous studies is presented, there is no indication whether the same instrument was used. The point is twofold: Are the data comparable and has the instrument been tested.

Many comparisons are made among graduates of varying curricula and graduation years. Although hypotheses were developed to explain some of the differences, no statistical analyses were performed to indicate whether they were likely to be merely chance differences. Thus, the need for further research designed to test those hypotheses is indicated.

* * *

"A Follow-Up Survey of the Graduates of the High Schools in Vocational Region #8, New Hampshire." Roger D. Crim and Eugene W. Ross. Paper presented to the New England Educational Research Organization Annual Meeting, Provincetown, Mass., May 6, 1976, 32 pp. (ED 123 471)

DESCRIPTIVE ANNOTATION:

This study, conducted to obtain a data base for New Hampshire Vocational Region #8 public secondary vocational educators, is intended to help them plan future curricula and programs. The issues addressed were education and training beyond high school, employment status during the first year after graduation, and current employment status.

The population comprised the 1968, 1970, 1972, and 1974 graduates of the six public high schools within Region #8. The population was stratified by school and graduating class, and a random sample was taken from each of the 24 strata. The sample (1266) was 50.5% of the population (2509).

An interview form was developed, using the Dictionary of Occupational Titles as a guide for categorizing vocations. The interview schedule is appended. Telephone interviewing was conducted by paid, trained interviewers over a two-week period. When the high school graduate could not be reached, information was collected, when possible, from a parent, grandparent, guardian, or spouse. Information regarding 840 graduates was collected, yielding a response rate of 66.4%. The response rates for all strata are tabled.

The data were tabulated in frequencies and percentages, and a composite profile for the region was obtained. No further statistical analysis was done.

Among the 36 findings listed are the following:

- 48% of the graduates received no additional education or training.
- 80% of the graduates were employed immediately after graduation.
- At the time of the study, 63% of the graduates were employed full-time.
- 30% of those employed were employed in clerical and sales occupations, 21% in service occupations.

The authors conclude that all six of their major vocational education areas are represented in the employment profile and that although 26% of the graduates indicated they were unemployed, only 7% were looking for work. Specific recommendations for the Laconia Area Vocational Center are made.

This study was sponsored by the U. S. Department of Health, Education, and Welfare. The senior author is an Assistant Professor of Education at Plymouth State College; the junior author is the Vocational Education Director of the Laconia Area Vocational Education Center #8.

EVALUATIVE COMMENTS:

From the stated purpose of the study, the reader would assume that the population consisted of graduates of vocational programs; however, this fact is not explicitly stated. Further, no differentiation in the various types of vocational courses taken by students was made. As a consequence, it is difficult to account for the reported employment rates.

Relying on sources other than graduates themselves to determine employment status posed a serious methodological problem. Further, there is no indication of how much data were collected from secondary sources. Without some sort of verification, the data cannot be considered reliable.

Since data were collected from graduates of several years, it is unfortunate that some form of trend analysis was not done which would be particularly useful if it could be related to any curricular changes made in those years.

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The Impact of Secondary School Occupational Education in Massachusetts. William G. Conroy, Jr., and Daniel E. Diamond. Lowell: University of Lowell, College of Management Science, Spring 1976, 43 pp. (ED 122 095)

DESCRIPTIVE ANNOTATION:

According to published goal statements, Massachusetts is committed to provide youth with the skills and experiences necessary for entry and success in the labor market. Because of this commitment and because of the wide variety of occupational education programs offered in Massachusetts, this study was conducted to examine the impact of high school programs on the life style of students: college preparatory, general/academic, and occupational programs. It was intended to provide a knowledge base for improving secondary education policy.

The study focused on school/labor-market relations but also addressed citizenship and leisure-time activities. The conclusions drawn and recommendations made in this report are not based on an exhaustive analysis of the data collected. However, the data are available from the Massachusetts Division of Occupational Education for anyone who may wish to explore the data base further.

The research design was ex post facto: A sample of students who graduated (or "should have") from Massachusetts high schools in 1969 and 1973 were asked to respond to a questionnaire mailed in the summer and fall of 1975. A multi-stage sampling plan was used: first schools, then students. A figure depicting the variables considered in the total design is provided. Questionnaires were mailed to 7,894 students: 2642 responded, 3452 did not; and there were 1800 non-deliverables. If non-deliverables are assumed to be random, the response rate was 43%. Although the findings are not corrected for bias, the data are weighted according to school sampling characteristics.

The survey instrument is not discussed or appended; however, categories of the questions asked are included in the figure depicting the study design. There is some discussion of the operationalization measurement of the variables; voting behavior is used as a "proxy" for citizenship; salary data are presented in terms of purchasing power of 1975 dollars.

Fisher t-tests, chi-squares, and correlation coefficients are used to analyze the data and their uses are described. The data collected about major non-educational influences on lifestyle were used as controls so the independent effects of school programs could be estimated. Tables breaking the data down according to such variables as school program, grade point average, and postsecondary education status are presented. Among the eleven summary findings presented and discussed are these:

- There were no differences in average income between females who had occupational training and those who had none.
- For students who did not go on to postsecondary education, the average annual salary of 1973 occupational students was higher than that of non-occupational students (a finding extremely pronounced for male Trade and Industrial students).
- Two-thirds of occupational students did not work in fields for which they had trained.

Among the conclusions discussed are these:

- The superior labor-market behavior of occupational students seems to result from the school program as an independent entity, because the effect exists, even after accounting for variables such as socioeconomic status and scholastic aptitude.
- Secondary schools play a minor role in helping youth find employment.

Six recommendations for Massachusetts policy makers are presented.

This study was initiated by the Division of Occupational Education, Massachusetts Department of Education. It was conducted by professors in the College of Management Science, University of Lowell.

EVALUATIVE COMMENTS:

This study is notable for the completeness of the information given, although it is unfortunate that no information regarding the survey instrument is provided. The design is clearly laid out, data were collected on intervening variables, and response bias was considered, although not analyzed. Several aspects of the questionnaire can be inferred from the discussions of summary findings but there is no indication of its reliability or validity.

Another notable aspect of this report is that of offering readers an opportunity to further explore the data base. Not only does this allow analysis of data collected but not analyzed, but also it allows analyzed data to be reanalyzed, perhaps by use of different methods.

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"Intensity of Occupational Training: Its Effects on Subsequent Labor-Market Experiences." Robert E. Allen and Thomas G. Gutteridge. *Community/Junior College Research Quarterly*. Vol. 2, pp. 367-380, 1978.

DESCRIPTIVE ANNOTATION:

This study was designed to investigate the relative effectiveness of occupational programs of public and proprietary schools at the postsecondary level. Although both kinds of institutions are designed to develop job skills, they tend to differ in the proportion of job skills training and liberal arts education offered. Two other studies have investigated this issue[8] but neither controlled for two important variables likely to affect postgraduate labor-market activity: geographic location and program quality. This study seeks to provide information which will enable the student to choose the type of program suitable to his/her specific abilities, needs, and objectives. The data collected to provide this information concerned student career aspirations and work educational experiences before, during, and after two-year college attendance.

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[8] S. M. Jung, V. N. Campbell, and J. M. Wolman, "A Comparative Study of Proprietary and Nonproprietary Vocational Training Graduates." *Journal of Vocational Behavior*, 1976, 8, 209-225. Wellford W. Wilms, *Public and Proprietary Vocational Training*. Berkeley: Calif.: Center for Research and Development in Higher Education, 1975.

The population comprised alumni who had graduated from four upstate New York two-year postsecondary institutions--two community colleges and two proprietary business institutes. Because both proprietary schools had been in existence for over 100 years and because proprietary schools are subject to extensive regulation in New York, the proprietary and public schools were assumed to be relatively homogeneous with respect to quality.

The sample consisted of a random sample of 50 graduates from each school having a graduating class between 1962 and 1970, thereby excluding the years 1965, 1967, and 1969.

Questionnaires were mailed to 1773 alumni and usable responses were obtained from 683 graduates (38.5%), but the number was reduced to make the sample more homogeneous by excluding non-business majors and graduates who had received baccalaureate degrees. The study sample, then, consisted of 173 proprietary graduates and 105 community-college graduates. A five-minute telephone interview was conducted with a sample of the non-respondents to assess non-response bias. Chi-square analyses indicated that respondents and non-respondents were not significantly different (.05 level) with respect to several variables.

An eight-page questionnaire was used for this study. Its development is not discussed nor is it appended. One question asked respondents to indicate for each full-time job since graduation (1) the name and address of the employer; (2) the scope of the business operation; and (3) the job title, functional area and annual compensation of the employee. Another question asked to what extent first and present jobs were related to training. Job satisfaction was measured through the Job Description Index developed by Smith, Kendall, and Hulin.[9]

The labor-market experiences of the public and proprietary samples were examined at two time points: at initial entry into the labor market and at the time of the survey. Chi-squares, t-tests, and multiple regression were used to analyze different aspects of the data.

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[9] P. K. Smith, L. M. Kendall, and C. C. Hulin, The Measurement of Satisfaction in Work and Retirement. (Chicago: Rand McNally, 1969).

Among the results discussed are these:

- The type of institution attended did not greatly affect the measured non-economic aspects of the later labor-market experiences.
- There was a sizable, but not statistically significant (at the .05 level) difference between present salaries of alumni of the two types of institutions, with those of community college graduates higher.
- Over 50% of the graduates were employed, both initially and at the time of the survey, in positions slightly or wholly unrelated to their training.

In conclusion, the authors discuss some of the limitations of this exploratory study. They acknowledge that it stressed investment rather than consumption values of education, that the time frame was short compared to the lifelong ramifications of education, and that the study was limited to four schools in upstate New York. Although they suggest the need for further research, they conclude that students can, apparently, "select a school with a pedagogy consistent with their educational objectives without jeopardizing subsequent career opportunities."

The researchers are from the Department of Business Administration, University of Wyoming, and the Department of Organization and Human Resources, State University of New York at Buffalo. The research was conducted pursuant to a grant (No. 91-36-73-13) from the Employment and Training Administration, U. S. Department of Labor.

EVALUATIVE COMMENTS:

Although this study has limitations, including those acknowledged by the authors, it is notable for at least two reasons: (1) It builds on previous research, thus adding to an integrated body of knowledge and (2) An effort was made to assess response bias. The authors' suggestion for further research needs to be followed to lend support to their conclusion that public and proprietary schools do not have differential effects on the career opportunities of students.

This conclusion is unwarranted on the basis of a single study because it is essentially an acceptance of the null hypothesis.[10]

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Job Selection Patterns: Linkage Between Vocational Education Programs and the Labor Market. George H. Copa and Bruce A. Kleven. Minneapolis: Minnesota Research Coordinating Unit for Vocational Education, Department of Vocational and Technical Education, University of Minnesota, February 1977, 161 pp. (ED 138 809)

DESCRIPTIVE ANNOTATION:

The purpose of this study was to develop and test a concept for defining the linkage between vocational education programs and the labor market. This concept, termed "job selection pattern," is defined as "a description of the jobs selected by program leavers in terms of frequency, occupation, industry, geographic location, and time." The authors state that meaningful planning of vocational education programs (i.e., planning that will insure gainful employment opportunities for program leavers) can be done on the basis of information concerning labor-market demand only if job selection patterns are identified and if the patterns are stable from year to year (or instability is explained). Stability of job selection patterns refers to the degree to which graduates of a particular program select jobs in similar occupations and industries in the same proportions from year to year. In order to test the job selection pattern concept on graduates of Minnesota area vocational technical institutes, the following objectives were accomplished:

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[10] See one of the research texts listed in the technical notes section of this bibliography for a discussion of this point. Very briefly, if research discovers a difference between two groups, it is clear that a difference exists, although the cause may be questionable. If no difference is discovered, however, it may be because the observational techniques and statistical analyses were not powerful enough or were otherwise unsuitable for detecting a difference.

- Describing the pattern of jobs selected by graduates
- Assessing the stability of the job selection pattern of graduates from year to year
- Describing the job selection of graduates by geographic location
- Assessing the stability of jobs selected by graduates from year to year
- Assessing the longitudinal stability of the job selection pattern by graduates

The information needed to complete this study had been collected through the Minnesota Vocational Follow-up System (a copy of a portion of the instrument is appended). However, all the information for every program had not been coded or stored in the computer system. Therefore, a purposive sample of program areas with stored information was selected. The criteria used for selecting the programs are discussed. The programs selected were as follows: agri-technology; automotive; clerical training; food preparation (chefs and cooks); electronics; machine shop; practical nursing; and sales and business management. Samples of students graduating in 1970, 1971, and 1972 were chosen to restrict the sample size to 100-150 graduates of each program who were employed each year. Thus, for some programs, a random sample was taken, whereas for smaller programs, all working graduates were included.

Graduates of 28 of Minnesota's 34 area vocational technical institutes were included in the sample. Demographic characteristics of the institutes and the students included in the sample are discussed, and a table is provided indicating numbers and percentages of students of those returning the follow-up questionnaire, and of those currently employed. The average return rate of the Minnesota Follow-up System over all postsecondary area vocational-technical institute graduates was approximately 80%.

Most of the data analysis was accomplished through compilation of frequency distributions and determination of percentages; chi-squares were used to assess the statistical significance of change in patterns over time.

Results of the study, relative to each of the objectives listed in the first paragraph of this annotation, are discussed by occupational program area. For each program area, a matrix is provided indicating percentages of graduates employed in various occupations (e.g., professional, sales, blue-collar) in various industries (e.g., agriculture, manufacturing, finance, entertainment). One of the findings discussed is the percentage of graduates over the three-year period remaining in the same major occupational and industry group from the first job to job-after-one-year (from 56 to 59% for most program areas).

Among the seven conclusions and recommendations listed and discussed are these:

- There is a characteristic pattern of jobs selected by graduates of vocational education programs unique to each program and with overlap between program areas.
- The job selection pattern changes during the first year after graduates leave vocational education programs, and the degree of change varies between programs.
- Follow-up data on vocational graduates should include the information necessary to construct job selection patterns, in order that the utility of the concept may be further assessed.
- Studies to explain the unstable aspects of job selection patterns should be initiated, in order to increase the utility of projected information concerning labor-market demand and to identify means of effecting needed changes in selection patterns.

EVALUATIVE COMMENTS:

The stated purposes of many vocational education evaluation studies indicate that the studies are done to provide information for planning purposes. The authors of this report state that information about job selection patterns can increase the validity of planning that is based on information concerning labor-market demand, but that data required to compile such information are rarely available. The authors acknowledge that further exploration of the job selection pattern concept is necessary, and this document makes a convincing case for the desirability of collecting the data necessary for such further testing.

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"Little Woolly Horses and Saber-Toothed Tigers: The Misguided Vocational Education Curriculum." Everett Egginton. Louisville: University of Louisville, n.d., 42 pp.[11]

DESCRIPTIVE ANNOTATION:

The intent of this study is "to examine the relationship between enrollment in vocational education programs and attitudes toward self and toward education." Specifically, it addresses the question "Does participation in vocational education programs result in positive attitudinal changes among students?" The author considers this question of general interest because there is "a lack of evidence to support educators' claims about the efficacy of vocational education programs..." and specifically because "alienation among students in vocational education programs...is at an all-time high even though positive attitudes toward self, toward education and ultimately toward work are unquestionably important goals of virtually all vocational education programs." The specific hypotheses tested are twofold: (1) Vocational education students have a more negative self-image than nonvocational or academic students. (2) Vocational education students have a more negative attitude toward learning than nonvocational or academic students.

The students constituting the sample were selected from public high schools in Kentucky through a proportional stratified random sampling technique. Schools were randomly selected from the state's fifteen vocational education regions, and a questionnaire was administered to approximately 50 per cent of the juniors and seniors from each selected school. Valid responses were obtained from 8145 students.[12] Two possible biasing factors were mentioned:

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[11] No further citation is given on this unpublished paper; however, an article based on it appeared in Phi Delta Kappan (April 1978, pp. 533-534) under the title "Is Vocational Education Meeting Its Objectives?"

[12] The total public high school enrollment in Kentucky in 1976 was 216,009 [U.S. Bureau of the Census. Statistical Abstract of the United States: 1977. (98th edition, Washington, D.C., 1977)]. Thus, over 3.7% of the juniors and seniors were sampled.

(1) Principals and guidance counselors, rather than researchers, drew the samples and administered the questionnaires; thus, improper sampling may have occurred and/or inadequate instructions regarding the questionnaire may have been given to the students. (2) Some of the schools randomly selected were unwilling to participate, thus the study sample may not have been representative of the population.

As part of the project directed by Dr. Keith Bayne (presumably another University of Louisville researcher), a 38-item multiple-choice questionnaire was administered to the above-described sample between September 1 and December 1[illegible], 1976. The study here annotated consists of an analysis of some of those questionnaire items. The purpose and development of the questionnaire are not discussed; the instrument is appended, however.

The independent variable--enrollment in a vocational program--was defined by answers to the question: "Are you presently enrolled in a vocational program (examples: business and office, distributive education, health occupations, agricultural education, etc.)?" All students who answered yes were classifified as vocational students, and the others, as nonvocational. General and college-preparatory students were not separately analyzed.

The dependent variables--self-image and attitudes toward education--also were measured by responses to specific items on the student-survey questionnaire. Two questions, each requiring a yes or no answer, were used to assess two aspects of self-image--defensiveness and inadequacy: "Do you usually feel like the world is against you?" and "Do you usually feel that most people do things better than you do?" The question used to assess attitude toward learning was not identified, but presumably it was "How do you feel about learning?" The choices were (1) like learning most of the time, (2) like learning some of the time, (3) like learning only things of interest, and (4) dislike learning most of the time.

Four control variables are used in analyses of the hypotheses: sex, age, ethnic origin, and family income. Although the questionnaire elicited more precise information, the latter three variables were artificially dichotomized: 16 and under--17 and over; white--nonwhite; $9,000 or less per annum--more than $9,000 per annum.

The data are all reported as cross-tabulations, including numbers of respondents as well as percentages; missing values and missing cases are reported. The phi coefficient of correlation was used in all analyses and the attained significance level is reported.

Among the results reported and discussed are the following:

- "Participation in the vocational education curricula is apparently associated with feelings of defensiveness, although the relationship is slight." (0 = .02)
- "The association between vocational education curricula and feelings of defensiveness holds--and indeed is strong--for students 16 and less but virtually disappears for students age 17 or more." (0 = .05 and .007 respectively)
- "Participation in vocational education curricula is associated with feelings of inadequacy, although, as was the case with defensiveness, the relationship is slight." (0 = .02)
- "When controlling the age, however, the relationship [between enrollment in vocational programs and feelings of inadequacy] is not sustained for either the younger students or the older students." (0 = .02 in both cases)
- "There is a significant and inverse relationship between enrollment in vocational curricula and [positive] attitude toward learning." (0 = .05)

The author concludes ". . . vocational education programs in general are ineffective in changing [the difference in attitudes between vocational education students and their academic counterparts]." He states, "Despite the massive investment of funds in vocational education programs and despite the recognition that vocational education curricula should address the problem of negative values and attitudes, the vocational education student still holds himself in low esteem and tends to treat learning with disdain."

Egginton then makes several recommendations not linked to the data analyzed in this study. For example, he states, "In order to begin to combat the problem of negative attitudes, low self-image, and disdain for learning among vocational education students, the larger society must provide the prestige, status, and remuneration which will make vocational education seem worthwhile to the student." Further, he supports views attributed to Terrel Bell, "Different and separately administered academic and vocational programs serve no useful ends"; to M. E. Borus, "On-the-job training, apprenticeships, and other non-formal methods of vocational training . . . are more efficient and cost-effective than the vocational training provided by schools"; and to P. J. Kelly, "The most important job skills which a high school graduate can possess are those provided by general education."

The author of this report is a professor at the University of Louisville. It is stated that Kentucky was chosen for this study because its "posture toward public vocational education programs appears to be representative of the willingness of many of the states to establish vocational education as a top priority in public education," and appreciation is given to the Kentucky Bureau of Vocational Education for permission to analyze the data, but no further indication of sponsorship for this study is given.

EVALUATIVE COMMENTS:

Although this study is notable in that, unlike the other studies listed in this bibliography, it addresses an immediate impact of vocational education, it is fraught with so many methodological problems as to make its conclusions unwarranted. This is not to say that the conclusions are necessarily inaccurate, but rather that they are neither supported nor contradicted by the study.

The instrument used in the study is appended, but its development is not discussed. No information is given concerning its reliability and validity. Even among the valid responses collected, each question analyzed in the study was answered by only one to three percent of the students. Further, no rationale is given for judging defensiveness, inadequacy, and attitude toward learning on the basis of one questionnaire item each.

Egginton hopes to answer the question "... Does participation in vocational education programs result in positive attitudinal changes among students?" His design, however, does not allow for analysis of change. No argument is made to support the assumed comparability of vocational high school students and all other high school students in terms of factors that may affect self-image. There is no attempt made to analyze statistically the collected data that best suits the question of change--

namely, the attitudes of sophomore vocational students as compared to those of senior vocational students.[13]

Another important problem is that of statistical significance as opposed to meaningful significance. Although several of the relationships analyzed were found to be statistically significant, the largest coefficient of determination obtained was .0098.[14] This coefficient indicates that less than 1% of the variance in any of the variables studied can be accounted for by any other variable. The meaningfulness of this small amount of variance is questionable.

Finally, Egginton draws conclusions that contradict his stated findings. For example, he concludes that group differences in self-image are sustained for older students although his results state that those group differences disappear for older students. The result, therefore, actually suggests that vocational education may contribute to an improved self-image. Further, he makes recommendations without clearly stating that they are not directly based on his findings. For example, he states that on-the-job training is more efficient and cost effective than vocational education provided by the schools, although the study does not address those issues.

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[13] Although it is stated that juniors and seniors were sampled, data tables indicate that sophomores were as well. Even if there were too few sophomores for meaningful comparisons, an exploratory comparison could have been made, accompanied by a suggestion for further data collection.

[14] See one of the research texts listed in the technical notes section of this bibliography for a discussion of this point. Briefly, the square of a correlation coefficient is the coefficient of determination. When multipled by 100, the result indicates how much of the variance in one correlate is explained (not necessarily caused) by the other.

1975 Career Student Follow-up: Initial Placement. Michael Quanty. Overland Park, Kansas: Office of Institutional Research, Johnson County Community College, April 1976, 25 pp. (ED 126 999)

DESCRIPTIVE ANNOTATION:

Johnson County Community College (JCCC) is required to report employment data on its graduates and on students who leave with marketable skills to the Kansas State Department of Education and the Kansas Manpower Utilization System for Training. These required data are used to justify expenditure of state and federal vocational funds on career programs. The college takes the opportunity provided by this mandated data collection to acquire additional data for use in its on-going self-evaluation process.

The 177 graduates and 41 nongraduates with "marketable skills" who left ten career programs (Basic Police Training, Data Processing, Dental Hygiene, Drafting, Electrical-Electronics Technology, Fashion Merchandising, Law Enforcement, Marketing and Management, Nursing, and Secretarial Careers) during the 1974-75 academic year constituted the basic population for this study. Responses were obtained from 94% of the population, and also from seven students from the program for the hearing impaired, two of whom were also enrolled in career programs.

Most of the data were collected through telephone interviews, although the students with hearing impairments were contacted personally. Career program coordinators telephoned graduates and early leavers from their respective programs; when the graduate or leaver was not available, the coordinator attempted to obtain information from a close relative or work associate. The telephone interview guide is appended. Questions addressed employment status (whether employed in program area, in a related area, or otherwise employed; whether attending school in a training-related area or in another area; unemployed; deceased or disabled; in the armed forces); adequacy of training; and gross annual and monthly salary. Additional questions concerning the specific programs were asked by some of the coordinators (e.g., concerning interest in alumni group participation, or in additional coursework).

The data are reported as percentages, both for the total sample and by program; no statistical analyses were performed. In addition, some data collected in the previous three follow-up studies are provided but no comparisons are made.

Several results are discussed. Of the former students, 70% were employed in a job for which they had been trained and 17% were in a training-related job. For two of the programs, students had to be employed before admission; and, excluding these students, 63% and 21% respectively were so employed. Of those employed in training or training-related areas, 67% believed their training helped them obtain their jobs. Overall, 93% rated the JCCC program as either excellent or good, and at least 80% of the students in each program gave excellent or good ratings. The two students with hearing impairments who had been in career programs (drafting, electronics) were employed full-time, but neither in the area of training. No interpretations are made or conclusions drawn from the results reported.

This report was done by a member of the college's Office of Institutional Research. According to the title page, it was prepared for administrative review.

EVALUATIVE COMMENTS:

Presumably, because the report was prepared for administrative review, it was purposefully left to the administrators to interpret results and draw conclusions. More information would facilitate this effort, for example, why some students do not find training-related employment and what particular aspects of their programs helped students obtain jobs--their diploma or the skills they had obtained. To allow such interpretations to be made, additional data need to be collected.

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1000 Employers Look at Occupational Education. Martin Hamburger and Harry E. Wolfson. New York: Board of Education of the City of New York, July 1969, 216 pp.

DESCRIPTIVE ANNOTATION:

This was the first in a series of studies planned to provide a sound base for curriculum redevelopment in the occupational education programs of the New York City Board of Education. The objectives of the overall plan to make fundamental changes in occupational education were as follows: (1) to improve the curriculum; (2) to extend occupational education to more youth; and (3) to introduce a multilevel approach with a variety of time and sequence organizations.

This study was designed to survey employers in an effort to determine how to prepare a greater number and variety of young people for better jobs. Effective questions to be asked were discussed in workshops--one composed of leaders from industry, commerce, labor, and education; the other composed of administrators, supervisors, and teachers in the New York City Schools.

This project was conducted from February 1 to June 30, 1968, following a long planning period. From all the occupational areas in New York City, a sample of curricular areas was selected based on diversity, importance, projected growth, and adaptability to a variety of school plants and organizations. The five areas selected--business, health, automotive, metal-working, and electrical/electronics--include predominantly male, predominantly female, and mixed occupations. They include also a range of skill levels ... a balance between white and blue collar, between industrial and service, and between stable and rapidly changing fields. Firms of various sizes were selected from each category. Interviews were held with 1056 employers, with usable data obtained from 994. Because the final sample was not chosen through a rigorous sampling plan, but rather was based on the criteria stated above and on availability and cooperation, the authors note that what was done was a case study of selected employers rather than a study of a random sample. Interviews were held with presidents, managers, personnel directors, and production supervisors.

Project staff prepared an open-ended questionnaire and interview guide but, after using it, decided that a more objective approach would be more fruitful. The instrument was then redesigned. The redesigned questionnaire, which is provided in an appendix, basically follows a checklist format, although open-ended comments related to each question are sought as well. Included are questions about job needs, job titles and duties, pay levels, desired educational levels, etc.

The instruments were used during team visits to each employment site. Five teams were selected, each including one teacher and one guidance counselor. Team members were assigned full-time to the project and were released from their teaching and counseling responsibilities for its duration. An intensive three-week training period was held, followed by weekly staff meetings during the beginning of the data-collection phase.

The data analyzed for this study consisted of responses to the survey questionnaires and impressionistic statements written by the interviewers. The interviewers also wrote recommendations for curriculum development. Quantitative data were synthesized into question-by-question summary tables and qualitative data were content-analyzed so they could be condensed. Excerpts from comments and recommendations are presented, both in the text and in appendixes.

Findings are presented primarily by occupational groupings in both a detailed chapter and a summary chapter. Among the findings discussed are these:

- Contacts between schools and employers tend to be "hit-or-miss."
- Employers indicate that the kind of reading skills taught, such as reading work orders and technical manuals, is as important as the amount taught.
- Although a substantial minority of employers consider on-the-job training best, for the most part employers feel that a school-job partnership is optimal for occupational training.

These and other findings are discussed in detail; many tables are presented; and limitations of the data are discussed as well as their implications.

This study was funded under the Vocational Education Act of 1963 and was approved by the Board of Education of the City of New York and the New York State Department of Education. One principal researcher was a Professor of Education at New York University and the other was Assistant Superintendent, Office of High Schools, New York City Board of Education.

EVALUATIVE COMMENTS:

This study was conducted to collect employer data for use in curriculum development. It can thus be viewed in the context of discovery rather than as an attempt to verify any hypotheses about the outcomes of vocational education. The report is exemplary in being very thorough: The purpose is clearly stated; the relationship between collection and analysis of data and the purpose is discussed; the procedures and instrumentation are detailed; and limitations of the study are discussed. The authors acknowledge one limitation: since no standards exist for determining how much contact there should be between schools and employers, a description of that amount of contact is an inadequate basis for appraisal.

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Outcomes of Vocational Education in Virginia 1978: A Summary of the Follow-up of 1976-1977 Secondary Vocational Education Completions in Virginia. Donald E. Elson. Richmond: Virginia Department of Education, Vocational and Adult Education, 1978, 18 pp.

DESCRIPTIVE ANNOTATION:

The information reported in this document was collected as part of the annual follow-up begun when the Vocational Education Reporting System (VERS) was implemented in Virginia during the 1972-73 school year. Data were collected from former students concerning employment status, on-the-job use of knowledge and skills learned in vocational programs, wage rates, and perceptions and attitudes toward their vocational programs. No specific research questions or hypotheses are listed.

This study was conducted in January 1978, approximately seven months after the close of the school year. The population was Virginia public high school students who had completed a vocational education program during or after the 1976-77 school year or who had left school with marketable skills before completing their programs (how their marketable skills were determined is not stated). All business education students and a stratified sample of students from other vocational programs were studied. Tables indicating total completions in each area, sample size, and number of usable responses are provided. The overall response rate was 55%, representing 10,961 usable responses from the 19,869 students surveyed. Response bias was analyzed using chi squares on various demographic characteristics. The data are summarized in a table. There are two statistically significant differences: (1) More females than males responded. (2) Proportionately fewer students who had left school prior to scheduled graduation returned questionnaires than students who were completers. Development of the instrument is not discussed, nor is it appended, but the several tables and the discussions clearly indicate the nature of the questions asked and the form of the response. Reliability and validity information is not provided.

Percentage data for all questions asked are presented in "pie charts" and bar graphs for each vocational program area. No statistical analyses were done. Comparisons are made to the 1975-76 school year.

Among the findings discussed are the following:

- 39.15% of the respondents were employed full-time in the field for which they were trained, or in a related field.
- 82.76% of the respondents were employed full- or part-time, were continuing their education, or were in the military service.
- 25% of the respondents were continuing their education.

It is concluded that vocational education programs are effective in helping former students to obtain employment.

The Vocational Education Reporting System was developed cooperatively by the Virginia Division of Vocational and Adult Education and the Division of Vocational and Technical Education, Virginia Polytechnic Institute and State University. The author is a faculty member. Staff of the Virginia Department of Education contributed to the data analysis and development of the report.

EVALUATIVE COMMENTS:

Although a purpose for this study was not stated, it can be inferred from the conclusion that the purpose was to assess the effectiveness of Virginia's public secondary vocational programs in helping students obtain employment. The follow-up system reported here may be capable of yielding accurate descriptive information about what has happened to former students, but it does not collect sufficient data from which to infer causes. In order to ascertain whether students obtained employment because of the program or some other factors or whether failure to obtain employment can be attributed to the vocational system, comparisons must be made and other data collected such as unemployment rates in general in the community, unemployment rates of nonvocational students, and availability of jobs.

Regardless of the quality of the reporting system, the response rate for this particular study was too small to ensure that the study sample was representative of the population. Although response bias was analyzed through use of demographic characteristics, there is no assurance that other factors, such as employment status, did not influence tendency to respond.

The ability of students to accurately assess the usefulness of their training is questionable, as is their tendency to give an honest and thoughtful response to a questionnaire item. Other data could be collected in an attempt to verify the conclusion that training is helpful. For example, employers' opinions could be sought or employed graduates of nonvocational programs could be asked whether they found their lack of training to be a disadvantage.

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"Outcomes of Vocational-Technical-Transfer Programs at Community Colleges, Technical Schools, and Similar Types of Institutions." Richard J. Noeth and Gary R. Hanson. Paper presented at the Association for Institutional Research Annual Forum, Los Angeles, California, May 1976, 16 pp. (ED 122 892)

DESCRIPTIVE ANNOTATION:

This study, conducted in 1975, was designed to assess the outcomes of post-secondary vocational-technical-transfer programs. Specific questions were addressed:

- What is the present educational-vocational status of individuals who began vocational-technical-transfer programs at community colleges, technical schools, and similar types of institutions in the fall of 1970?

- How do students' final programs relate to their occupational experiences and to their future occupational plans?

- Do individuals working in program-related occupations feel that their post-secondary training affected the level of their present employment?

- Are individuals working in program-related occupations satisfied with their present jobs and would they go through the same program again?

In the fall of 1970, 22,342 students from 110 community colleges, technical schools, and similar institutions across the nation completed the American College Testing Program's Career Planning Program as part of the National norming (of ability, interests, job choice, job values, etc.).

In 1975 a follow-up sample of 4,350 former students was selected from the above group. For this sample, male and female students were selected from Business and Marketing, Accounting, Science, Social Science, and Arts and Humanities programs; only males were selected from Electrical Engineering Technology and Auto Mechanics; and only females from Nursing programs. A final response rate of 60%--equivalent to 95% of those for whom accurate addresses were available--was achieved with 2594 former students from 109 institutions responding.

The survey questionnaire was pretested extensively before it was mailed to the student sample. Its development is not described nor is the instrument appended.

The data from all former students who responded to all the items pertinent to each analysis were cross-tabulated--vocational programs (Business, Auto Mechanics, etc.) by criterion measures (present occupation, job satisfaction, etc.). Several tables are provided.

The following findings related to each of the four study questions are discussed:

- Among the respondents, 1,489 were employed outside the home, 234 were continuing their education, 124 were homemakers, and the rest were unemployed for various reasons.

- Most of those currently employed held jobs for which they were trained (percentages are provided by program area).
- Over 75% of the currently employed individuals agree that they could not have obtained their present jobs without their post-secondary education.

Among the major conclusions discussed are these:

- About 75% of currently employed students are employed in their area of training.
- Students tend to gravitate toward jobs related to the educational program they have completed, although their first job may not be directly related.
- Those employed in training-related jobs are highly satisfied with their present occupations and the majority would enter their training programs again, if faced with a choice.

This study was conducted by a research psychologist and the Assistant Director of the Developmental Research Department, Research and Development Division, The American College Testing Program.

EVALUATIVE COMMENTS:

This study cannot be replicated from the information given, but since it is a report of a paper presented at a conference, that is not to be expected. Cross tabulations of data are provided but because statistical analyses are not, it is not clear how likely it is that differences are due to chance.

The stated purpose of this study is to assess outcomes of post-secondary vocational-technical-transfer programs. It is unfortunate that the reason behind the purpose is not stated. It is difficult to further evaluate the study without knowing how it was meant to be used. It does give an indication of the average (nationwide) success of the programs studied, but sufficient information for further conclusions is not provided.

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A Program Review of Secondary Vocational Education in Ohio: Job Placement and State Funding. Ohio Legislative Services Commission, Staff Report No. 126, April 1978, 73 pp.

DESCRIPTIVE ANNOTATION:

This study was done to provide feedback on the results of earlier vocational education policy and funding decisions and to provide useful information and guidelines for future legislative decisions. The study focuses on the job placement of vocational graduates (at the secondary level) and on related issues such as graduate job satisfaction and graduate performance as evaluated by employers. The issue of how state funds can be better distributed to meet program costs is also addressed but will not be discussed in this annotation.

Ten vocational education planning districts (VEPDs) were randomly selected from the 65 that had graduated their first senior class by 1976. Four-day field visits were made to schools in these districts and one-day visits were made to Akron City Schools and to a Joint Vocational School in the Columbus area (on the recommendation of the State Vocational Education Division that they had excellent placement programs). One hundred sixty-six employers were interviewed by phone. Formal questionnaires were administered to vocational instructors and to placement coordinators, as well. The sample districts are described in an appendix.

The questionnaires used in the staff field visits are not discussed in the report, although they are appended.

Findings are presented in narrative form in tables of percentages and graphs of trends from fiscal year 1974 through fiscal year 1976. Comparisons on job placement are made among VEPDs and among vocational programs. Employers, where possible, compared vocational graduates to graduates of general programs.

The results are discussed in great detail, including consideration of intervening factors such as availability of employment. The following findings are reported:

- Vocational programs similar to those offered by technical colleges or proprietary schools do not have good placement records.

- More than 90% of the graduates indicated that they would enroll in vocational education again.
- Students and teachers expressed concern with technical skills, whereas employers stressed employability skills and adaptability.
- 58% of the employers hire vocational graduates for jobs that non-vocational high school graduates cannot fill without further training.
- 76% of employers said they prefer to hire vocational graduates rather than general high school graduates.
- A few students in each sample district said they would have dropped out of high school had there not been a vocational program.

Two conclusions reached are that the vocational education program in Ohio has been relatively successful in job placement and that employers, while generally satisfied with the skills of vocational graduates, would favor increased communication with school officials. The need for a closer look at guidance and counseling and at the effects of vocational screening is suggested, and other areas for further research are indicated.

In 1977, the Ohio Legislative Services Commission selected a Subcommittee on Legislative Oversight; it subsequently recommended education as one area for joint legislative-staff oversight projects. Staff and legislators received training and technical assistance in program review from Rutgers University's Eagleton Institute of Politics. This study was one of the projects undertaken. It was reviewed and monitored by the Joint Education Committee for Program Evaluation.

EVALUATIVE COMMENTS:

This study was well defined and thoroughly conducted. It is one of the few studies that compare perceptions of teachers, students, and employers. It is notable also for its discussion of economic conditions in the labor market and other variables that affect placement rates. Lacking are (1) a discussion of the development of survey instruments and (2) the collection of placement rate data for non-vocational graduates.

* * *

A Study of Community College Students Who Are Graduates of Vocational Technical and College Preparatory Curriculums. Ronald J. Horvath. Schnecksville: Lehigh County Community College, Pennsylvania Department of Education, Bureau of Vocational, Technical and Continuing Education, July 1, 1973, 96 pp. (ED 096 554)

DESCRIPTIVE ANNOTATION:

Although most community colleges maintain an open-door admissions policy, there are varying interpretations of the concept; some colleges limit admissions to students who have completed high school college preparatory curricula, whereas others also admit students who have completed vocational curricula. The author states that decisions on interpretation of the open-door concept are seldom based on empirical data. This research focuses on the issue in an attempt to provide teachers, counselors, and administrators with better insights into the needs and background of students (e.g., Should students take vocational or college preparatory curricula if they intend to enter community college, and should they enroll in transfer or occupational programs?). Specifically, the following three questions are addressed:

- Are community college students who are graduates of vocational technical programs similar to or different from graduates of college preparatory programs in intellective and demographic characteristics?
- What are the relative completion or non-completion records of college preparatory graduates as compared with those of vocational technical graduates?
- What are the intellective and demographic characteristics of the vocational technical graduates who enroll in a related college curriculum, in an unrelated one, or in a transfer program?

Six hypotheses relative to these questions are investigated.

All male students in two Eastern Pennsylvania community colleges who could be identified as having completed one year or more in a high school vocational technical program (excluding commercial, general, industrial arts, and distributive programs) constituted the vocational technical (VT) sample; 229 were identified. The college preparatory (CP) sample consisted of a random sample of 200 male graduates prorated among the entry years of 1967, 1968, 1969, and 1970, using the number of VT entrants as a base. This represented 10-15% of the full-time male population. Approximately 90 percent of the students in the samples were graduated from high schools within the sponsoring districts of the two colleges (included are four vocational technical secondary schools and no comprehensive secondary schools).

The primary sources of data were the students' college transcripts and personal files, which contained high school transcripts, class ranks, IQ scores, and American College Test (ACT) scores.

Demographic differences and graduation and program associations were tested with chi-squares. The primary data analyses, of group differences, were accomplished through univariate analyses of variance (t-tests and F-tests). A .05 level of significance was used in interpreting the results.

Although CP graduates scored significantly higher than VT graduates on six of the seven educational variables tested (the exception was high school rank) and achieved significantly higher first-semester and final grade point averages, there was no significant difference in college graduation rates for the two groups. Therefore, the author concludes that this study adds a degree of credibility to the community college open-admissions policy. Other results, pertaining to the different community college programs VT graduates enter, are discussed and areas for further research are suggested.

The author is affiliated with Lehigh County Community College, one of the colleges in the study. Apparently, the sponsor of the study was the Pennsylvania Department of Education, Bureau of Vocational, Technical and Continuing Education.

EVALUATIVE COMMENTS:

An important strength of this study is that it had a specific purpose and hypotheses related to other research, as indicated in the literature review section. Thus, the study adds to a body of knowledge rather than being an isolated work. Further research is clearly needed, however. For instance, the relative importance and consequences of community college grades and community college graduation should be investigated. Following that determination, correlates of grades and graduation that are more specific than the general vocational technical as opposed to college preparatory high school curricula should be investigated.

* * *

A Study of the Costs, Benefits, and Effectiveness of Occupational Education. Austin D. Swanson. Buffalo: Faculty of Educational Studies, State University of New York at Buffalo, March 1976, 96 pp. (ED 120 523)

DESCRIPTIVE ANNOTATION:

This study was conducted to provide the Board of Cooperative Educational Services (BOCES) for the district serving nine component school districts south of Buffalo, with "evidence as to what, if anything, was being accomplished [by its vocational programs] that was beneficial to the region." Five evaluative criteria had been previously established by the Board and its professional staff, and two were added for this study:

- Upon completion of an occupational program, 65% of the students will indicate that they would take the same program again if they were making the choice.
- 75% of the graduates of any licensed occupation program will pass the appropriate examination.
- Within six months after graduation 60% of the graduates available for and having sought employment will be employed full-time.
- Within six months after graduation, 35% of the graduates available for and having sought employment in their specialization will be employed full-time in their area of specialization.
- Within six months after graduation, another 15% of the graduates available for and having sought employment in their specialization will be employed full-time in a position they consider related to their area of specialization.
- The high school dropout rate will show a decline over the years.
- A high school education will prepare graduates to participate successfully in a wide variety of conversation topics and in leisure and civic activities.

This study was designed to address those criteria and to accomplish the following objectives as well:

- To compare per pupil costs of vocational and non-vocational high school programs in the Buffalo, New York, metropolitan area

- To compare the relative success of vocational students and non-vocational students in terms of employment and earnings and also in terms of selected non-economic considerations (on the basis of the established objectives listed above)

- To calculate benefit/cost ratios for vocational programs

- To develop decision matrices for evaluating likely costs and effectiveness of alternate approaches for meeting the district objectives for occupational education

The three phases of the study, conducted during the 1974-75 academic year, were (1) a program cost analysis, (2) collection of effectiveness and control data, and (3) (3) cost/benefit-cost/effectiveness analyses. Costs were determined on a per pupil basis for the 1972-73 school year. Effectiveness data were sought from the 628 participants of BOCES occupational programs who were members of the classes of 1969, 1971, and 1973 and from a random sample of 422 non-BOCES, non-college bound[15] students from the classes of 1967 (prior to establishment of the BOCES program), 1969, 1971, and 1973. Usable responses were received from 61.5% of the BOCES alumni and 55.2% of the non-BOCES alumni. A table indicating response rates from each class is provided. School and background characteristics were analyzed for respondents and non-respondents to determine whether there were any significant differences between the two groups. The only statistically significant difference found was between the Occupational Grade Average of BOCES respondents and that of non-respondents; since the averages were 79 and 78, respectively, it is doubtful that the difference has practical significance.

The study design and methodology are thoroughly described as are the methods of analysis. For example, the difference between expenditures and costs is defined: "Expenditures refer to the dollar value of resources purchased during a given time period ... [whereas] costs refer to the amount of resources consumed during a time period." As another example, it is stated that average teacher salary figures are used to preclude a bias against programs that happened to be staffed with more experienced teachers.

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[15] Non-college bound students were those for whom no high school credentials were sent to post-secondary institutions during or shortly after their senior year. Approximately 20% of these students did attend a post-secondary institution, but "long after leaving high school."

Two instruments were used to collect effectiveness data, and both are appended. The School Record Form was used to consolidate data taken from school files, including, for example, grade average, class rank, IQ, standardized achievement test scores, and major course sequence. The Alumni Survey Questionnaire has three forms: (1) a mailed questionnaire for BOCES alumni; (2) a mailed questionnaire for non-BOCES alumni; and (3) a telephone interview schedule used as a follow-up for non-respondents. The first two forms of the Survey Questionnaire were identical except that the terms "high school" and "Vocational Center" were interchanged where appropriate. Three hundred twenty-one responses were gleaned from the mailed questionnaires and 309 from the telephone interviews. The telephone questionnaire was, in essence, an oral version of the mailed questionnaire: both the substance of the questions and the response formats were the same.

Study findings are reported under several subheadings: cost analysis; school record profiles of BOCES and non-BOCES students; student performance compared with district objectives; cost/benefit analysis; and cost/effectiveness analysis--BOCES vs. home school programs; curtailing expenditures while maintaining effectiveness; and increasing effectiveness without increasing total cost. The terms graduates, alumni, and students are used interchangeably throughout discussion of the findings; for simplicity, the 30 students who did not graduate are not differentiated from those who did.

Among the findings the following are reported and discussed:

- There are considerable differences between students who select BOCES occupational programs (i.e., those who spend some of their school time working in a job related to their training under a cooperative arrangement between the school and the employer) and students who select specializations in their home schools. Although most students in both groups viewed high school as the terminal point in their formal education, the non-BOCES group includes occupational majors such as business and home economics as well as non-occupational majors such as art and foreign language.

- The non-BOCES students scored significantly higher (.05 level) on IQ tests and achieved markedly higher percentile rankings in reading and mathematics achievement tests and in class rank. The differences are similar when males and females are analyzed separately, although they are more dramatic for males.
- When the BOCES option became available, there was a decline in the ninth and tenth grade dropout rates but an increase in the eleventh grade dropout rate. Dropping out may have been deferred in anticipation of the BOCES option but, when provided, the option may not have been sufficient to keep some students in school until graduation.
- For the entire period of the survey, 40% of the non-BOCES students indicated that they would not re-enroll in the same program if they had to make the choice again, whereas 27% of the BOCES students would not re-enroll.
- Of the cosmetology graduates who took the licensing examination, 94% passed; however, 38 out of the 107 graduates did not take the exam.
- 82% of the male BOCES graduates and 81% of the male non-BOCES graduates located a full-time job within six months of graduation.
- BOCES and non-BOCES alumni had similar characteristics in such matters as conversation topics, leisure-time activities, and participation in organizations.
- In the cost/benefit analysis, the only independent BOCES effect on hourly wages was that males earned more in their first jobs--an average difference of 24¢.
- The Trade Electricity program was the only program that had a benefit/cost ratio in excess of 1.0; after seven years it was 2.0 and growing.

This study was conducted by a Professor of Education at the State University of New York at Buffalo for the Board of Cooperative Educational Services.

EVALUATIVE COMMENTS:

This is a complex study; various aspects of it need to be assessed according to different criteria. The report is very thorough and well organized with a detailed table of contents and several tables facilitating use of the document.

The study is notable for at least two reasons: (1) The characteristics of respondents and non-respondents are compared; (2) graduates from two general types of programs are compared. It is perhaps unfortunate that no differentiation is made between the non-BOCES students enrolled in occupational programs and those not enrolled in this area; ... however, the assumption presumably is based on the theory that all high school programs are in a sense "occupational" for students who do not intend to pursue further education or training. This is an issue that deserves further attention.

A brief discussion of the pitfalls of Cost-Benefit and Cost-Effectiveness analysis can be found in Attachment "C". Findings of this study should be considered in light of those pitfalls.

* * *

A Study of the Status and Effectiveness of Cooperative Office Education in New Jersey, 1968-69. Carmela C. Kingston. Occupational Research Development Monograph No. 8. Trenton: The Research Coordinating Unit for Vocational-Technical Education, Bureau of Occupational Research Development, Division of Vocational Education, New Jersey State Department of Education, 1970, 40 pp. (ED 060 182)

DESCRIPTIVE ANNOTATION

This study was done to determine the status of public secondary cooperative office education (COE) programs in

New Jersey and to evaluate the effectiveness of those programs in preparing students for office jobs. It was also meant to serve as a model for evaluation of other cooperative programs. It was hypothesized that COE students would be superior to non-cooperative office education students in the following respects: that they would be employed sooner, would have more responsible positions, would receive higher earnings, would have greater job satisfaction, and would be rated more highly by their supervisors.

The population comprised personnel from New Jersey secondary public schools having COE programs during the 1968-69 school year: principals, business education department chairpersons, cooperative education coordinators, COE graduates and non-COE graduates (those who had been enrolled in business classes and who had planned to secure office jobs after graduation but ... had not participated in cooperative programs); employers of those graduates were also included. All the principals, chairpersons, and coordinators and "as many as possible" of all the cooperative office education students and cooperating business firms were contacted. Further information regarding the sample is not given, but from the table "Percentage of Replies to Each Form" it can be determined that 735 of the 1,112 employers contacted responded (66.1%) to part of the study, although fewer completed the employer rating form and that 294 out of 400 (73.5%) of COE graduates and 476 out of 900 (52.9%) of non-COE graduates responded to the Job Information Questionnaire.

Several instruments, with their development based on a literature review, were used to collect data: a questionnaire concerning factual information, opinions, and viewpoints sent to every New Jersey public high school principal; questions comprising background information, participating students, cooperating business firms, the COE coordinator, the State Department of Education, and additional information sent to each COE coordinator; questions sent to graduates concerning their cooperative job experiences (if they had any) and their present jobs; job-performance rating instruments sent to employers for completion. The questionnaires were sent approximately four months after graduation. All instruments were in written form, and they included rating scales, multiple-choice questions, and open-ended questions. None of the instruments are appended nor are reliability and validity discussed.

Data were tabulated using IBM computers; t-tests and chi-squares were used to test differences between COE and non-COE graduates. Several tables are provided. Among the 34 findings and conclusions reported are the following:

- Employers were strong supporters of COE.
- Only 20% of COE students were able to participate in school activities.
- Approximately 80% of the COE graduates were employed full-time in an office.
- COE graduates obtained jobs faster than non-COE graduates.
- There was no significant difference between COE and non-COE graduates at job entry in weekly gross wages received by office workers; however, at least one increase in pay was reported by significantly more COE graduates, and a significant difference in weekly gross wages was evidenced five months after graduation.
- Both COE and non-COE graduates experienced a high degree of job satisfaction.
- Supervisors indicate that both groups need to demonstrate more initiative in job performance.
- Although COE graduates received higher ratings than non-COE graduates in every area of job performance, the only ratings that were significantly higher (.05 or .01 levels) were in attitude toward work, attitude toward others, and overall ratings.

Twenty-eight recommendations are made, ranging from use of continuous reporting and follow-up systems, to more varied job-training experiences, to improved school-placement functions. Suggestions for further research are made, including a study to determine whether or not more secretarial than clerical students are encouraged to participate in COE programs and a feasibility study to determine the desirability of establishing certification standards for coordinators.

This study was done as partial fulfillment of the requirements for the author's doctoral degree. Permission to do the study was granted by the New Jersey Division of Vocational Education.

EVALUATIVE COMMENTS:

The most obvious problem with this study is the lack of sampling information. The reader is given no indication of possible response bias or of why all the responses were not used in the analyses (although presumably this was the result of incomplete responses). Further, although the author states that instrument development was based on a literature review, there is no indication of pilot testing or of consideration of reliability and validity. This information is necessary to determine how warranted the conclusions are.

For exploratory purposes and as a model for others, this study was quite thorough, however. Many factors were investigated from several perspectives, and statistical analyses were done. Further research along these lines should include consideration of intervening and control variables.

* * *

"The Success of Vocationally Trained Women in Traditionally Male Occupations." David J. Pucel. Paper presented at the American Vocational Association Convention, New Orleans, December 9, 1974, 20 pp. (ED 141 504)

DESCRIPTIVE ANNOTATION:

With the passage of laws disallowing sex discrimination in employment practices, educational institutions have stopped using sex as a basis for determining enrollment in particular programs. This study was done to examine a portion of the impact of this changing societal concept on vocational education. Four basic questions were asked:

- Are women exercising their right to enroll in the traditionally male occupational training programs[16] of the Minnesota Area Vocational Technical Institutes?

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[16] A traditionally male occupation was defined as an occupation in which at least 80% of the employees are males. Such occupations were identified through the 1970 Minnesota Census Data.

- Do women who enroll in traditionally male programs judge the training programs similarly to men enrolled in the same program?
- Do women who graduate from traditionally male programs receive or perceive equal benefits in the world of work?
- Do employers of the women who graduate from traditionally male programs judge them equal to men?

Only 21 females who graduated in 1972 or 1973 from traditionally male occupational training programs and on whom the Minnesota Vocational Follow-up system had data were identified. The study was continued in spite of this small sample because of the importance of the topic. The 21 females were drawn from eight program areas; 21 males were proportionately sampled from the same areas to complete the study sample. Data obtained from the Minnesota Vocational Follow-up System data tapes were analyzed using a chi-square technique. Several percentage tables are presented as well.

Among the findings and conclusions discussed are the following:

- The largest female enrollment in traditionally male areas was 51% and 46% in chemical technology for 1971-72 and 1972-73.
- None of the analyses of male and female judgments of their training programs yielded significantly different results.
- The first job salaries of the women were significantly lower than those of the men. Pucel notes that data collected did not distinguish among the occupations in which the respondents were employed.
- The employment-status differences one year after graduation were substantial, although not statistically significant--66.7% of the males were employed in training-related occupations compared to 38.1% of the females.
- The women who received training equal to that of men were not as satisfied with the employment they entered as were the men.

- None of the employer ratings of women were statistically different from their ratings of men. However, the women were rated lower in terms of quality of work, quantity of work, job-related knowledge, and equipment operation. Three possible reasons are offered: a difference in occupations, bias against women, and an actual difference in performance.

This study was conducted by a Professor of Vocational and Technical Education at the University of Minnesota who is also Director of the Minnesota Vocational Follow-up System.

EVALUATIVE COMMENTS:

The author cautions against making weighty decisions on the basis of this study because the sample was so small. Still, this has value as an exploratory study because it raises questions that can be investigated through further research.

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Vocational Education Planning Districts in Ohio: An Economic Evaluation of Foregone Benefits from Limited Participation. I. A. Ghazalah. Columbus: Division of Vocational Education, Department of Education, State of Ohio, February 1975, 56 pp.

DESCRIPTIVE ANNOTATION:

The author states, "The purpose of the economic analysis of publicly financed programs is to assist decision-makers in the allocation of a given set of scarce resources among competing uses." This particular study was undertaken because "knowledge about the potential net benefits ... to society from increasing the percentage of senior high school students who receive job training should assist in the appropriate development of vocational education in [Ohio]." The specific objectives of the study were as follows:

- To estimate, on the basis of enrollment during the fiscal year 1973, Total Net Social Benefits (TNSB) from vocational programs at 11th and 12th grade levels in each of four sample vocational education planning districts
- To estimate the TNSB that would accrue from increasing enrollment in each sample to 40% of the average daily membership in those grades
- Based on sample data, to estimate for each planning district the TNSB for the fiscal year 1973 and the potential increase from increased enrollment
- To provide absolute as well as relative economic value of the array of vocational education programs

A sample of four vocational planning districts was selected for the study: (1) a single vocational district with eleven member schools; (2) a multiple vocational district with five member schools; (3) a small joint vocational school district with six member schools; and (4) a large joint vocational school district with sixteen member schools.

Three sources of data were used in the study: schools and school districts; the state Division of Vocational Education; and published data from the U.S. Department of Labor and the Ohio Department of Education. Interviews were held with school superintendents and administrators to obtain and clarify financial, enrollment, and program data about each school and follow-up data on its students. Trainees in each school completed questionnaires concerning demographic and earnings (from part-time employment during training) variables. The Division of Vocational Education supplied unpublished enrollment data. The published data sources provided wage rates, labor-force participation rates and survival probabilities, and cost-per-pupil-data.

Although the objectives of vocational education are multidimensional, the state-of-the-art in economic analysis does not allow specification of a single functional relationship that uniquely encompasses all the dimensions. Therefore, "Since vocational education is principally aimed at increasing the productivity of human resources, this study [is limited] to an evaluation of vocational education as an investment goal, i.e., in terms of its contribution to the objective of raising the output of goods and services in the economy as measured by the increase in the earning power of participants in vocational education." Costs and benefits to society as a whole are evaluated. In the analyses, "Social Present Value I" is calculated with the assumption that without vocational education the student would have dropped out of school after the 10th grade to enter the labor market. "Social Present Value II" is calculated with the assumption that without vocational education, the student would have completed the 11th and 12th grades in the academic curriculum. Separate calculations were made for males and females.

Based on his calculations, the author concludes that, on an absolute basis, all the evaluated vocational programs--except child care--have positive social present values, making them worthwhile investments. The relative value varies with program, with methods of calculation of social present value, and with sex. Tables detailing these findings are provided. The computed estimates indicate that increasing vocational education participation by 40% would result in a statewide increase in net social benefits from $108,918,528 to $326,951,424.

The author of this document is a Professor of Economics at Ohio University. The project was supported by funds from the Ohio Department of Education, Division of Vocational Education.

EVALUATIVE COMMENTS:

The assumptions underlying the economic anlysis and the equations used are discussed in detail. However, the data used in the analysis are not. Sources of data are listed but there is no indication of how reliable the data sources are or how valid the trainee questionnaire was, and no indication of how any possible limitations in the data would affect the results.

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Vocational Technical and Adult Education: Student Follow-up Study of 1974-1975 Completions. Jim Preston. Sarasota County, Florida: Sarasota County Board of Public Instruction, May 21, 1976, 68 pp. (ED 124 685)

DESCRIPTIVE ANNOTATION:

This is a report of the fourth annual study of Vocational Technical and Adult Education (VTAE) conducted in Sarasota County, Florida. It is based on data anlysis provided by the local District Data Processing Department before the surveys were sent to the state centralized reporting station. Thus, this report was developed to give timely data to decision makers before the narrative descriptions were written. The survey questionnaire addressed employment availability, employment status, job classification, quality of training, reason for employment outside a training-related area, average weekly pay, source of assistance in finding job, and post-secondary education. It was hoped that the information provided would increase the ability of decision makers to allocate resources and to assist in planning, reviewing, and evaluating the vocational programs in Sarasota County.

This survey of 1974-75 completers was conducted in 1976. An alert card was mailed to the sample in January and the second survey mailing and personal contacts to nonrespondents were made in February.

The survey population was 1025 Vocational Preparatory program completers from the Sarasota County Vocational-Technical Center and three high school Home Economics and Cooperative programs. (A listing of specific courses and respective response rates is provided.) Many hours were spent in deleting from the state computer listings of vocational students the names of those taking only one course and that course for some reason other than job preparation. Names of 430 were deleted before the questionnaires were mailed. The response rate was 63%, which was raised to 67% by additional responses received after the deadline. Though not included in this report, these late responses were analyzed with very similar results.

A pilot instrument for the annual studies had been developed in 1971 and changed little until the time of this survey. Changes were made to accommodate federal requirements for collecting veteran and Comprehensive Employment and Training Act (CETA) data. The instrument appears in the report. The author states that, although validity studies per se have not been done, the high response rate and the lack of differences in responses between prompt and late responders should increase confidence in the data.

Tabular percentage data for the questions addressed are provided for each of the following groups: (1) the total survey sample, (2) students enrolled in home economics and cooperative programs, (3) total enrollment at the Vocational Technical Center (VTC), (4) VTC students enrolled in health occupations, industrial programs, and office occupations, (5) secondary students, and (6) post-secondary students.

Among the findings reported are (1) that of those available for employment in a training-related area, 80% were employed--64% of them in their area of training or a related field and (2) that, after completing their secondary programs, 22% of the respondents went on to post-secondary training--about half of them in a related program.

The annual studies are sponsored by State Department officials, who supply survey forms and set the schedule for mailing them; this report was prepared by Jim Preston, Program Specialist, Placement and Follow-up, Sarasota County Board of Public Instruction.

EVALUATIVE COMMENTS:

This report consists, for the most part, of summary data tables, i.e., frequency (percentage) charts, with very little interpretation of results. A benefit of this format is that the report can be produced quickly, giving decision makers access to data before decisions have to be made. Another advantage is that specific information sought often can be more easily found in a table than in narrative form. However, there are disadvantages to this format as well. Frequency tables can be misleading in that they present only frequencies of occurrences--information that may be crucial to the interpretation of differences in frequencies is lacking. For this reason, those who consider the "data without interpretation" format should consider the disadvantages as well as the advantages.

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IV. EPILOGUE: RECAPITULATION AND ASSESSMENT

This epilogue summarizes substantive findings reported in the descriptive annotations and methodological issues discussed in the evaluative comments. It is intended to give the reader a quick overview of data-based claims made about some outcomes of vocational education. Readers are cautioned that findings presented here are inferences based on a review of the thirty-one studies included in this bibliography.

Several of the studies were designed specifically to provide information for describing or for improving particular programs, rather than to add to a body of knowledge about vocational education outcomes. Still, these studies are easily accessible to a wide audience, and their results may mistakenly be regarded as widely generalizable by individuals who are unfamiliar with the canons of research. It is hoped that this epilogue will be helpful in indicating where further research is needed and where improvements can be made in conducting and reporting evaluation studies. Thus, it is meant to be helpful both to readers of evaluation reports and to evaluators.

The methodological issues discussed here in reference to the annotated studies are discussed more generally and in greater detail in Section II above and in the references provided at the end of that section.

It is difficult to draw conclusions based on this set of studies because of several definitional problems:

- The populations studied are often not clearly defined.
- When populations are defined, reasons underlying the choice of definitions are not stated.
- Reasons underlying the choice of operational definitions[1] of the outcomes under study are not stated.

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[1] An operational definition indicates how an outcome is to be measured. For example, intelligence is frequently operationally defined by scores on a standardized intelligence test. Job satisfaction can be defined by scores on a job satisfaction rating scale or by an employee's tardiness or use of sick leave.

After a discussion of difficulties created by definitional and other problems, the epilogue turns to methodological issues as they apply to several types of outcomes:

- Employment and education status
- Earnings
- Student satisfaction with training
- Job satisfaction
- Job performance

Populations

In general, the populations for these studies are sets of individuals who have been enrolled in vocational programs. However, terms are not used consistently in the different studies. For example, "high school vocational graduates" as used in one study may indicate those graduates who had taken vocational courses in either the eleventh or twelfth grade, whereas in another study, the term may indicate students who completed two credits in a vocational program during a school year.

Not only is there inconsistency among studies in the use of various terms related to the population, but often the terms used are not clearly defined. This makes it difficult to determine when comparability exists. For example, studies may include "early leavers with marketable skills" along with program graduates without specifying how such early leavers are distinguished from dropouts.

Presumably there are reasons underlying the specific definitional choices made. If those reasons were stated, it might be possible to determine what populations, although different in specifics, are comparable enough to be considered together by those wishing to draw conclusions. The thirty-one studies we reviewed are comparable, with respect to their populations, only in that all address those students, graduates, or leavers characterized as "vocational" by the authors.

Operational Definitions of Outcomes

In most of the studies the operational definitions of the outcomes investigated are implicit, if not explicit. For example, the reader can discover how an outcome was defined by perusing the questionnaire used in the study. In some cases, however, studies report on an outcome such as employment in a training-related field without indicating how "training-related field" is defined or determined and without appending the instrument. Thus, identical or similar labels may be used in different studies for outcomes that are not comparable. Table I provides a list of several outcomes with definitions preventing comparisons among studies and examples of the questions left unanswered when definitions are not explicit.

Table I

OUTCOMES OFTEN NOT CLEARLY DEFINED--AND RESULTANT UNANSWERED QUESTIONS

- Employment in occupational program area/in area related to occupational program (How are the two differentiated?)

- Job satisfaction (How is it evidenced, by self-report or employee turnover? Is it an all-inclusive term or subdivided into areas of satisfaction such as earnings and working conditions?)

- Satisfaction with education or training (What is the point of asking? How is it determined? Did training help students find or keep a job? Would students recommend program to others?)

- Self-image, self-concept, self-esteem (As used, are these all labels for the same construct? How is the feeling measured?)

- Earnings (Does the term refer to weekly gross earnings or average annual income? How can various earnings variables be compared?)

(Continued on the following page)

Table I (Continued)

OUTCOMES OFTEN NOT CLEARLY DEFINED--
AND RESULTANT UNANSWERED QUESTIONS

- Employment/Unemployment rates (How are they calculated? Is the employment rate based only on those available for work?)
- Effectiveness of program (If the study is done to determine how effective the program is or how to improve effectiveness, what is the definition of effectiveness?)

Other General Issues

The non-comparability of both populations and outcome definitions makes any attempt to draw conclusions from this set of studies difficult at the outset. For this reason, some other issues related to comparability of studies are relatively less important: for example, differences in response rates and data collection and analysis procedures. Still, these and other methodological issues are relevant to the assessment of outcomes in any given study and they are not adequately addressed in several of these studies.

One such issue is response bias, which is particularly likely to occur in cases where the response rate is small. Even the studies that do attempt to analyze response bias fail to acknowledge that the factor(s) influencing tendency to respond may interact with the outcome(s) being assessed. When this is the case, bias cannot be analyzed easily. For example, if the unemployed tend not to respond to employment status questionnaires, this bias may not be discovered through analysis of demographic variables associated with the respondents and those non-respondents who can be reached by phone.

Another issue is the reliability and validity of the data-collection tools or techniques. Few studies discuss the degree to which valid and reliable data have been collected. For example, when relatives are asked to report on an "unreachable" individual's employment status, there should be indication of whether the accuracy of the report was determined. Reliability and validity should be assessed even when the data collection appears to be straightforward.

A list of questions related to these and other issues is provided in Table II. These questions are left unanswered in most of the reports of studies annotated in this bibliography. A discussion of methodological issues related to particular outcomes follows the table.

Table II

METHODOLOGICAL QUESTIONS UNANSWERED IN MANY OUTCOME STUDIES

- Were questions asked so long after the event (e.g., vocational training, first job) that one might question accuracy of recall?
- Might geographic, demographic, etc., variables have had such an influence that the study results cannot reasonably be attributed to vocational education at all or cannot be applied to vocational education in other settings?
- Was the study sample representative of the stated population? Were appropriate sampling procedures used? Was the response rate sufficiently large? Was response bias analyzed?
- Was the methodology powerful enough (sensitive instruments, appropriate data analysis, sufficiently large sample size...) to detect effects of the vocational program?
- Did the research design cover the probable threats to validity? What assurance is there that the observed result was a function of vocational education rather than of some unmeasured variable(s)? What comparisons were made?
- Were data collected from reliable sources? (How accurate are school records? How accurate is information collected from a relative of a graduate?)
- Was the instrumentation or data collection tool/technique carefully developed, pilot-tested, and revised to promote reliability and validity? Were questionnaire items ambiguous or leading?

(Continued on the following page)

Table II (Continued)

METHODOLOGICAL QUESTIONS UNANSWERED IN MANY OUTCOME STUDIES

- Were data collection conditions optimal--questionnaires easy to complete, trained interviewers, comparable conditions of administration?
- Are results that are statistically significant also meaningful? How much variance in the effect is associated with vocational education?
- Can differences confidently be attributed to vocational education rather than to chance? Were data collected in a way that permits statistical analysis? Was statistical analysis done when appropriate?
- When data were statistically analyzed, were appropriate statistics used? What assumptions were violated and with what probable effects?
- To what degree might factors/tendencies such as social desirability, acquiescence, and halo-effect influence questionnaire responses? And to what degree might some of these factors affect tendency to respond?
- What is the rationale for assigning positive and negative values to various points on a scale, since with more response alternatives taken to be positive than negative, a random assignment of rankings would result many more times in a positive response than negative?

Employment and Education Status

Some researchers differentiate "employment in area of training" from "employment in training-related areas," and others combine the two. Few describe the criteria for determining whether a job is actually in the area of training or is related to training, and if so, to what degree. Some ask the respondents whether their jobs were training-related whereas others ask for job titles and use the *Dictionary of Occupational Titles* to make a determination. Some report percentages of graduates or leavers with full-time jobs only, some report those with part-time jobs as a separate category, and others do not indicate their criteria for placing an individual in an employment category. Although the studies generally report graduates' employment status soon after the students left school (e.g., from six months to one yea the data may be collected from six months to eight years later (does a job held eight years ago seem to have the same degree of training relatedness to the respondent as it did during the first six months after graduation?).

Some studies report the percentage of employed graduates based on the total number of survey respondents whereas others use the number available for employment as the base. Some report employment status by occupational program area, some by sex, and others provide no partitions. Few studies compare employment status of vocational students to any other set of students or to any standard at all.[2]

This variation makes it difficult, if not impossible, to draw valid conclusions. It does appear that on the average, a greater percentage of postsecondary vocational graduates find employment and particularly training-related employment than do high school vocational graduates. The reasons, however, are not addressed; among the possibilities are that high school graduates prefer to seek further training or receive more specialized training and are therefore more marketable, and that employers consider young adults more desirable than teenagers as employees. It also appears that graduates of some occupational program areas are more likely than graduates of others to obtain employment and to obtain training-related employment. Further, the occupational program areas may interact with level of education.

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[2] Reporting rates of employment rather than unemployment creates problems of calculation and comparison. People who are employed ("worked at all as paid employees" during the survey week, according to U. S. Bureau of Labor Statistics [BLS] definitions) are easy enough to count, but in calculating a rate of employment, one must define and gather data for an appropriate base. This may be all labor force participants, only those people who are "available for employment," or some other population set. With the base determined, however, what comparisons can be made to give meaning to the rate calculated for the vocational graduates? Labor force statistics published by state and federal government agencies focus on unemployment (i.e., number of unemployed workers divided by the civilian labor force), rather than employment. Unless the base used in computing employment rates for vocational students is the same as the BLS base used in calculating unemployment rates, it is not possible to convert the rates for purposes of comparison. Thus, if an evaluation report indicates an employment rate of 92% for vocational graduates whereas the official unemployment rate for the relevant ag group is 16%, anyone reporting that the unemployment rate of vocational graduates was only half that of the general population would be in error, and any inferences drawn from that conclusion would be misleading.

Some areas for further research are obvious: definitions must be specified; comparisons need to be made; the correlates of employment/unemployment status (for example, occupational program, sex, educational level) need to be investigated.

The findings relevant to educational status suffer from the same general problems. It appears that more high school graduates seek further education or training than postsecondary graduates, certainly not an unexpected finding.

Earnings

Conclusions about earnings are even more difficult to draw than conclusions regarding employment or education status. When results are reported strictly as dollar amounts, any comparison between studies failing to consider the year of the study and geographic differences in prevailing wage rates would not be meaningful. Not only do many studies report dollar amounts without providing other data necessary for interpretation, but they also fail to compare earnings of vocational graduates with those of other graduates or with other standards, and they fail to partition graduates by program area. Further, some studies report average annual salary, others report beginning weekly gross earnings, and others aggregate annual earnings.

Because there is essentially no basis for comparison, no general conclusions about earnings can be drawn. In order for earnings to be an appropriate outcome criterion for evaluating vocational education, the research community must agree on some standards of comparison.

Student Satisfaction with Training

Students are considered highly satisfied with training when they agree with statements like the following:

- If I had the choice to make again, I would choose the same program.

- I would recommend my program to other students.

- My training helped me to get my job.
- My training has helped me on the job.
- I was satisfied with my training.

This outcome was assessed through written or telephone questionnaires, sometimes with multiple items, sometimes only one, sometimes using a yes/no format, sometimes using a five-point rating scale. Although some researchers indicate that they pilot-tested their instruments, few discuss any aspect of instrument development or validation. Without careful development and testing there is no indication to what degree respondents' answers are influenced by response sets such as acquiescence, halo effect, or leniency;[3] by ambiguous or unclear statements; or by inadequate response choices (i.e., no response fitting what the respondent wants to indicate). Thus, the only conclusion easily drawn is that, when asked, most graduates will indicate a high degree of satisfaction with their training.

Further research is needed in two areas: instrumentation and correlates of satisfaction. If student satisfaction with training is important, it is certainly important to know what fosters and what hinders it; it may also be important to know what effects it has. To adequately assess any aspect of training satisfaction, the instruments must be carefully developed and their validity and reliability must be analyzed. Much research has gone into the development of instruments for assessing various attitudes; such research is needed in the area of training satisfaction as well.

Job Satisfaction

Job satisfaction has been determined in two ways: through use of a published job satisfaction scale and by asking a single question on a questionnaire or telephone interview, something like, "Are you satisfied with your job?" The issues in assessing job satisfaction, then, are similar to those in measuring training satisfaction, and the suggestions for further research are analagous. Further, some studies suggest that job satisfaction is higher for graduates in training-related jobs, but others do not distinguish those with training-related jobs from those with other jobs. This, then, is an area needing further research.

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[3] Acquiescence is the tendency to make positive responses; halo effect refers to the tendency to say good things about every characteristic based, for example, on a general positive feeling about what or who is being rated, or on one strong point; and leniency is the tendency to give the more positive rating when unsure of which rating to give.

There is a body of literature on job satisfaction,[4] indicating that it is a multidimensional concept amenable to assessment from various perspectives. For example, job satisfaction may be inferred, in part, from turnover rates and use of sick leave. Vocational education researchers would do well to examine the literature and to do further research on what kinds of measurement are most appropriate for evaluating vocational education against a job-satisfaction criterion.[5]

Job Performance (Attainment of Occupational Competencies)

One way to evaluate job performance is to ask employers how their employees perform on the job, the only technique (beyond asking the graduates whether their training contributed to their job performance) used in any of the thirty-one studies presented in this bibliography. This is not to say that performance testing is not done, but it does not appear to be done often in vocational education outcomes evaluation.

Only a few of the thirty-one studies reviewed in this bibliography sought employer perceptions, and those that did are fraught with problems limiting the degree to which their results contribute to knowledge about the job performance of vocational education graduates. One problem is the use of presumably untested, unvalidated rating scales. As discussed in the section on training satisfaction, without careful development and testing there is no indication to what degree respondents' answers are influenced by factors unrelated to the substantive content of the rating scale.

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[4] See, for instance, Robert P. Quinn and Martha S. Baldi de Mandilovitch. Education and Job Satisfaction: A Questionable Payoff. Washington, D.C.: U. S. Department of Health, Education, and Welfare, National Institute of Education, March 1977. This document is annotated in the Appendix of Key Related Literature.

[5] See Kenney E. Gray, Marie Abram, and Floyd McKinney. Vocational Education Measures: Instruments to Survey Former Students and Their Employers. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1978, for a review of some of the instruments available.

Another problem is that data indicating the extent of employers' experience with vocational graduates have not been collected (for example, total number hired, percentage of employees from vocational programs, how long vocationally trained employees have been used). Further, the data that have been collected have not been verified. For example, hiring-preference data consisting of questionnaire responses have not been verified by inspection of personnel records.

Finally, comparative data have not been collected. Some questionnaire items asked whether graduates of vocational programs were better employees than graduates of general programs, but none compared performance ratings of vocational and nonvocational graduates.

With all these difficulties, the only conclusion that can be drawn from these studies is that employers tend not to express dissatisfaction with employees who are graduates of vocational programs. Further research is needed to overcome the problems discussed above. More studies should address multiple factors of performance to discover whether vocational education affects some factors but not others. It cannot be overemphasized that there are several problems inherent in the use of rating scales that can be summarized by the statement that a rating scale often reveals more about the rater than about the substantive content of the scale. Thus, it is very important that rating scales be carefully derived and thoroughly tested and that verification be done where possible through use of other assessment techniques.[6]

Other Outcomes

Other outcomes addressed in some of these studies include leadership, voting behavior (as a proxy for societal participation), self-image, academic standing, success of women in traditionally male jobs, and dropout rates. These outcomes were not addressed by enough studies to permit even an attempt at synthesis of findings. In most cases, the research suffered from the limitations discussed above in reference to particular outcomes.

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[6] See Attachment "C," Table II, which indicates types of data that can be collected for evaluation purposes.

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[1] This index is provided for the reader who is interested in who sponsors empirical outcome studies. The sponsors often are not explicitly identified; attribution of sponsorship thus is sometimes an inference. Complete citations for these documents are provided along with the annotations on the pages indicated.

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VOCATIONAL EDUCATION OUTCOMES
(Final Report on Year One of the R & D Project
"Examining Vocational Education Outcomes and
Their Correlates")

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I. INTRODUCTION

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Entries are listed alphabetically by title within the following categories:

Category 1: Data-Base Reports

Category 2: Review and Synthesis Papers

Category 3: Evaluation Methodology

Category 4: Empirical Studies Focusing on Vocational Education Topics Other Than Outcomes

Category 5: Miscellaneous

Data-base reports included here provide statistics and other information pertinent to national studies of vocational education outcomes, including explanations of how the data were collected. These reports are utilized by researchers, evaluators, practitioners, policy makers, and the general public. Illustrative of Category 1 are Learning a Living Across the Nation, the "Project Baseline" series produced for the National Institute of Education (NIE), and National Longitudinal Study of the High School Class of 1972, surveys sponsored by the National Center for Education Statistics.

Review and synthesis papers provide an overview of various facets of vocational education evaluation. They help identify critical issues, report diverse perceptions and conclusions of evaluators, and list bibliographies of relevant literature. An example of the type of document included in Category 3 is Program Evaluation in Vocational Education: A Review, a paper produced for the Educational Resource Information Center (ERIC) Clearinghouse on Career Education as part of its information analysis series.

Documents that discuss evaluation methodology, models, frameworks, and systems applicable to vocational education are included in Category 3. Because there is a large body of literature in this area, only a sample of publications frequently cited or highly recommended by vocational education administrators and researchers was selected. An example is Evaluating Vocational Education: Policies and Plans for the 1970s, which details a variety of methods for measuring educational output and addresses analytical problems involved in the evaluation of vocational education.[1]

As explained above, the main body of the bibliography provides descriptive and evaluative annotations of empirical vocational education outcome studies: reports of empirical investigations concerning the consequences of vocational programs. Entries in Category 4 of this appendix, in contrast, are restricted to evaluation studies of other aspects of vocational education, namely context, student characteristics, resources (including facilities), goals, and processes. One example is What is the Role of Federal Assistance for Vocational Education?

Finally, Category 5 includes miscellaneous documents which discuss vocational education or themes vocationally related from a variety of perspectives. For example, youth employment is studied not only as an outcome of vocational programs, but also in terms of government-subsidized jobs. Included in this section is a study sponsored by the NIE, Education and Job Satisfaction: A Questionable Payoff. Evaluation reports on special needs subpopulations, sex fairness, career education, economic education, and other general/academic education programs are also represented in this section.

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[1] As is the case with other publications listed in the appendix, this book also contains material included in other categories. No multiple listings are made, however

As indicated previously, citations and annotations are presented alphabetically by title within the respective categories (with initial articles "A," "An," and "The" ignored in placing the publications in alphabetical order). In contrast to the annotations presented in the main body of the bibliography, the appendix annotations are descriptive only. In most cases, the document's purpose, major themes, conclusions, and author identities are reported.

Numbers designated "ED," where provided in the citations, refer to the accession number sequentially assigned to documents as they are processed into the ERIC system and published in the monthly abstract journal Resources in Education of NIE. These documents, except as noted in Resources in Education, are available in either microfiche or hard copy (paper) from:

ERIC Document Reproduction Service (EDRS)
P. O. Box 190
Arlington, VA 22210

Many university libraries have collections of ERIC microfiche. When no ED number is given for a particular document, it presumably has not been entered in the ERIC system.

Following the annotations are three consolidated indexes which provide a listing of all categories, arranged alphabetically by:

- Author (cross-indexed to title and category)
- Project Identifier/Publisher (cross-indexed to title and category)
- Title (cross-indexed to category)

APPENDIX OF KEY RELATED LITERATURE

Category 1: DATA-BASE REPORTS

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Career Thresholds: A Longitudinal Study of the Educational and Labor Market Experience of Male Youth. Volume 2. Frederick A. Zeller and others. Center for Human Resource Research, The Ohio State University, 1970. 168

Career Thresholds: A Longitudinal Study of the Educational and Labor Market Experience of Male Youth. Volume 3. Andrew I. Kohen and Herbert S. Parnes. Center for Human Resource Research, The Ohio State University, May 1970. 168

Career Thresholds: A Longitudinal Study of the Educational and Labor Market Experience of Male Youth. Volume 4. Andrew I. Kohen. Center for Human Resource Research, The Ohio State University, January 1973. 169

Career Thresholds: A Longitudinal Study of the Educational and Labor Market Experience of Male Youth. Volume 5. Paul Andrisani and Andrew I. Kohen. Center for Human Resource Research, The Ohio State University, April 1975. 170

Career Thresholds: A Longitudinal Study of the Educational and Labor Market Experience of Male Youth. Volume 6. Andrew I. Kohen and others. Center for Human Resource Research, The Ohio State University, March 1977. 170

Dual Careers: A Longitudinal Study of Labor Market Experience of Women. Volume 1. John R. Shea and others. Center for Human Resource Research, The Ohio State University, May 1970. 171

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[1] Complete bibliographic citations for these titles, along with supplementary information, are provided with annotations on the pages that follow. References are to page numbers appearing at the bottom of the page.

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Learning a Living Across the Nation. Volume 1. Project Baseline Second (Sic) National Report. Baseline Year: 1970-1971 (Fiscal Year 1971). Arthur M. Lee. Northern Arizona University, November 1972. 173

Learning a Living Across the Nation. Volume 2. Project Baseline Second National Report. Baseline Year: 1971-1972 (Fiscal Year 1972). Arthur M. Lee and Robert Sartin. Northern Arizona University, November 1973. 173

Learning a Living Across the Nation. Volume 3. Project Baseline Third National Report. Baseline Year 1972-1973 (Fiscal Year 1973) Part 1 and Part 2. Arthur M. Lee. Northern Arizona University, November 1974. 174

Learning a Living Across the Nation. Volume 4. Project Baseline Fourth National Report. Baseline Year 1973-1974 (Fiscal Year 1974). Part 1 and Part 2. Arthur M. Lee. Northern Arizona University, December 1975. 175

Learning a Living Across the Nation. Volume 5. Project Baseline Fifth National Report. Baseline Year: 1974-1975 (Fiscal Year 1975). Part 1 and Part 2. Arthur M. Lee. Northern Arizona University, November 1976. 176

National Longitudinal Study [of the High School Class of 1972] Review and Annotations of Study Reports. Samuel S. Peng and others. Center for Educational Research and Evaluation, Research Triangle Institute, May 1977. 179

National Longitudinal Surveys Handbook. Herbert S. Parnes. Center for Human Resource Research, The Ohio State University, 1977. 183

The Pre-Retirement Years: A Longitudinal Study of the Labor Market Experience of the Cohort of Men 45-59 Years of Age. Volume 1. Herbert S. Parnes and others. Center for Human Resource Research, Ohio State Univ., Oct. 1968. 184

Project Talent. The American High School Student. John C. Flanagan and others. University of Pittsburgh, 1964. 185

Project Talent Data Bank: A Handbook. David V. Tiedeman. American Institutes for Research, April 1972. 186

Project Talent One-Year Follow-up Studies. John C. Flanagan and others. University of Pittsburgh, 1966. 186

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Years for Decision: A Longitudinal Study of the Educational and Labor Market Experience of Young Women. Volume 1. John R. Shea and others. Center for Human Resource Research, The Ohio State University, February 1971.	187
Years for Decision: A Longitudinal Study of the Educational and Labor Market Experience of Young Women. Volume 2. Roger D. Roderick and Joseph M. Davis. Center for Human Resource Research, The Ohio State University, March 1973.	188
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Youth in Transition. Volume 1. Blueprint for a Longitudinal Study of Adolescent Boys. Jerald G. Bachman and others. Institute of Social Research, University of Michigan, 1967.	190

APPENDIX OF KEY RELATED LITERATURE

Category 1: DATA-BASE REPORTS

Citations and Annotations

Career Thresholds: A Longitudinal Study of the Educational and Labor Market Experiences of Male Youth. Volume 1. Herbert S. Parnes, Robert C. Miljus, and Ruth S. Spitz. Columbus: Center for Human Resource Research, The Ohio State University, 1970, 276 pp.

Data reported and analyzed in the six volumes entitled Career Thresholds were collected from interviews with a national sample selected to be representative of approximately 16 million young men in the U. S. civilian non-institutionalized population who were in 1966 between the ages of 14 and 24. The general purpose of these studies is to contribute to an understanding of the factors that influence labor market "success" for young men of this age group.

In addition to educational and labor market experiences of the young men, the study examines their command of occupational information, their job attitudes, and their educational and occupational aspirations. Among the explanatory variables investigated are age, family structure, financial condition, skills, health and physical conditions, school experiences, and certain environmental variables such as size of labor force and unemployment rate.

The data reported as a result of the first round of interviews in 1966 were subjected to tabular analyses as an initial step in identifying the variables most influential in explaining variations in aspirations and labor market experiences. Chapter 2 of Volume 1 describes the demographic and social characteristics of the group, examines the distribution of the characteristics, and considers some of the interrelations among them. For instance, blacks were found to fall below whites on all of the socioeconomic status indicators--they were less likely to be enrolled in the college preparatory curriculum, they had completed fewer years of school, and they were less likely to have had vocational training outside of the educational system. Youth with rural backgrounds were less likely to be in school than those from urban areas.

Factors are investigated in Chapter 3 that appear to differentiate young men who are employed from those who are not.
3. The lower unemployment rate of young men in their twenties than that of those in their teens was related to the likelihood that the older group was better educated, married, white, and non-students.

Chapter 4 examines the types of jobs the young men hold, hours worked per week, and rate of pay. For the young men 20-24 years of age not enrolled in school, hourly rate of pay was found to be nearly uniform among the major occupation groups and was found to be positively related to the number of years of school completed, to the extent of occupational training outside regular school, to good health, and to the size of the residence community.

Chapter 5 describes and analyzes findings from a section of the survey concerned with measuring the respondents' "knowledge of the world of work." Scores from a sample occupation information test (reproduced in Appendix F of Volume 1) are related positively to extent of education, measured intelligence, and socioeconomic status. When educational attainment is controlled, those with high scores on the occupational information test receive higher wages than those with low scores.

Chapter 6 explores attitudes of the employed youths toward their jobs. The majority--90 per cent of the whites and 85 per cent of the blacks--expressed positive feelings about their jobs. Educational and occupational aspirations reported in Chapter 7 indicate that young men between 14 and 17 still enrolled in school have very high educational and occupational goals. Sixty per cent say they want to obtain four or more years of college, and 70 per cent want at least two years of college. Almost half say they want to be in professional or technical occupations by age thirty.

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Career Thresholds: A Longitudinal Study of the Educational and Labor Market Experience of Male Youth. Volume 2. Frederick A. Zeller, John R. Shea, Andrew I. Kohen, and Jack A. Meyer. Columbus: Center for Human Resource Research, The Ohio State University, October 1970, 161 pp. (ED 047 104)

This volume reports findings of the second round of National Longitudinal Survey interviews of young men and is characterized as a progress report designed to describe the magnitude and patterns of change that have occurred between the first and second interviews--changes in school enrollment status, labor force participation, unemployment experience, occupational mobility, and educational aspirations. Summarized findings include the following:

- Downward revision of aspirations was most prevalent among those whose 1966 educational goals were highest and whose socioeconomic indicators appeared least supportive.
- While youths suffer high rates of joblessness and the problem is especially severe for blacks, a substantial portion of the unemployment reported is for those still in school before their transition to full-time work.
- High rates of occupational movement may reflect inappropriate early job choices but may also reflect a "healthy flexibility" that permits adjustments leading to improvement in status.

* * *

Career Thresholds: A Longitudinal Study of the Educational and Labor Market Experience of Male Youth. Volume 3. Andrew I. Kohen and Herbert S. Parnes. Columbus: Center for Human Resource Research, The Ohio State University, May 1970, 165 pp. (ED 054 336)

Findings of the third round of interviews conducted in 1968 are summarized in Volume 3, and changes in educational and labor market status occurring during the two years between the first (1966) and third (1968) surveys are described. The report states that since the external environment--the labor market--was fairly similar at the two points in time, it is assumed that changes in status of the members of the sample are primarily attibutable to the changes in their personal characteristics. For instance, the effect of "aging"--two additional years of schooling and/or work and life experience--may have profound effects on their depth of understanding and seriousness of purpose.

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Career Thresholds: A Longitudinal Study of the Educational and Labor Market Experience of Male Youth. Volume 4. Andrew I. Kohen. Columbus: Center for Human Resource Research, The Ohio State University, January 1973, 208 pp. (ED 074 280)

During the three-year period between the 1966 and 1969 interviews, a third of the young men changed their school enrollment status, a fifth changed their marital status, and a tenth of the students and more than a fourth of the non-students changed county (or Standard Metropolitan Statistical Area) of residence at least once.

While it was noted that high school graduates were more likely than dropouts to have favorable labor market experiences, it was acknowledged that both dropping out and unfavorable labor market experiences may be attributed to social and personal disadvantages.

Following are some of the differences found between graduates and dropouts:

- Graduates had lower rates of unemployment and were more likely to be employed full time.
- Graduates had advanced to higher occupational levels.
- Graduates were more likely to have participated in a formal occupational training program.
- While immediate monetary advantages of completing high school are not evident, by the third year after leaving school, graduates were earning higher hourly rates of pay than dropouts.

In examining changes in the educational and occupational goals of the young men continuously enrolled in school since the original interview, nearly one-half had changed their educational goals and three-fourths had revised their occupational aspirations. Changes in occupational preferences were found to occur mainly within, not across, occupational categories.

* * *

Career Thresholds: A Longitudinal Study of the Educational and Labor Market Experience of Male Youth. Volume 5. Paul Andrisani and Andrew I. Kohen. Columbus: Center for Human Resource Research, The Ohio State University, April 1975, 92 pp. (ED 111 961)

This report explores the impact of collective bargaining coverage on the 1969-1970 labor market experiences of a subset of members of the group who were 17 to 27 years of age, not enrolled in school, and employed as blue-collar workers in 1969.

The study led to the conclusion that collective bargaining coverage had a substantial net impact on the hourly earnings of blue-collar young men both white and black. Among blacks, those who are unionized experience less unemployment than those who are non-unionized.

* * *

Career Thresholds: A Longitudinal Study of the Educational and Labor Market Experiences of Young Men. Volume 6. Andrew I. Kohen, John T. Grasso, Steven C. Myers, and Patricia M. Shields. Columbus: Center for Human Resource Research, The Ohio State University, March 1977, 383 pp. (ED 138 831)

This volume analyzes the educational and labor market experiences from 1966 to 1971--a five-year period which could be expected to reflect not only the impact of the Civil Rights movement and the effects of a period of relatively high employment (1966 to 1969) followed by a period when unemployment began to rise (1969 to 1971) but also the impact of military service on subsequent labor market experience for those returning to the civilian labor market.

Chapter 2 reports findings on goal formation and revision behavior, concluding that goal development by young men is an adaptive process developing over time.

Chapter 3, "The Labor Market Effects of Investment in Human Capital," further explores the connection between education and work. The findings suggest that schooling, formal training, and on-the-job training are all important for achieving labor market success during the early career period. However, measures of high school or college quality were not found to be related to labor market achievements, nor did the data indicate the existence of a credentials effect or the advantage of one high school curriculum over another. The study found (p. 192--Erratum) "no evidence . . . that graduates of high school vocational curricula fare better than other graduates in terms of starting rates of pay." The group's occupational mobility is explored in Chapter 4; youth unemployment and the various kinds of job separations are analyzed in Chapter 5; and determinants and consequences of serving in the armed forces during the Vietnam war are considered in Chapter 6.

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Dual Careers: A Longitudinal Study of Labor Market Experience of Women. Volume 1. John R. Shea, Ruth S. Spitz, and Frederick A. Zeller. Columbus: Center for Human Resource Research, The Ohio State University, May 1970, 288 pp. (ED 043 755)

The first of four volumes published under the title Dual Careers reports survey data gathered from a representative sample of women who were 30 to 44 years of age at the time of the first survey in 1967.

Factors such as education and previous work experience, presence and ages of children at home, personal health and that of other family members, family income, access to child-care services, and attitudes toward the role of women are analyzed in an attempt to determine the extent to which they influence women's employment patterns, kinds of jobs accepted, earnings, and job satisfaction.

Of particular interest in the study of this group are experiences and problems associated with re-entry into the labor force by married women after their children no longer require their continuous presence at home.

Among the survey findings reported are the following:

- Women who had never been married experienced net upward mobility from their first to their current job.
- Women who were, or had been, married start lower on the occupational ladder and more of them experience downward mobility than experience upward mobility.
- Over 20 per cent of the white women and 33 per cent of the black women were married before age 18.
- Of those married before 18, a third of the whites and just over half of the blacks completed less than four years of high school.

Other volumes entitled Dual Careers and reporting data from subsequent interviews in the original five-year study include the following:

Dual Careers: A Longitudinal Study of Labor Market Experience of Women. Volume 2. Sookon Kim and others. Columbus: Center for Human Resource Research, The Ohio State University, September 1972, 131 pp. (ED 068 713)

Dual Careers: A Longitudinal Study of Labor Market Experience of Women. Volume 3. Carol L. Jusenius and Richard L. Shortlidge, Jr. Columbus: Center for Human Resource Research, The Ohio State University, February 1975, 187 pp. (ED 108 053)

Dual Careers: A Longitudinal Study of Labor Market Experience of Women. Volume 4. Herbert S. Parnes and others. Columbus: Center for Human Resource Research, The Ohio State University, December 1975, 329 pp. (ED 124 312)

Additional surveys of the women in this sample were conducted in 1974, 1976, and 1977; and surveys are planned for 1979, 1981, and 1983.

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Learning A Living Across the Nation. Volume 1. Project Baseline Second [sic] National Report. Baseline Year: 1970-1971 (Fiscal Year 1971). Arthur M. Lee. Flagstaff: Northern Arizona University. November 1972, 454 pp. (ED 095 309)

This first report in a series of five published under the title Learning A Living Across the Nation uses Project Baseline data to describe and analyze the status of vocational education and manpower training programs between 1970 and 1975. This series was prepared for the National Advisory Council on Vocational Education as a result of a request for information by the Appropriations Committee of Congress. The statistical data reported are drawn primarily from official state records combined with statistical data from the U. S. Census Bureau and the U. S. Department of Labor and include data from state education agencies not required by the U. S. Office of Education. Volume 1 reports data for the 1970-1971 school year.

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Learning A Living Across the Nation. Volume 2. Project Baseline Second National Report. Baseline Year: 1971-1972 (Fiscal Year 1972). Arthur M. Lee and Robert Sartin. Flagstaff: Northern Arizona University, November 1973, 499 pp. (ED 095 310)

Volume 2 is characterized as a companion volume to the first in the series of Project Baseline reports. Since the first and second volumes were issued simultaneously, many of the tables in the second volume contain first-year data not found in Volume 1. Vocational education enrollment, cost, and placement data for the 1971-1972 school year are reported according to secondary, post-secondary, and adult levels of instruction by program areas.

Serious limitations to the usefulness of the data are explained as outgrowths of problems of definition, communication, and, in some cases, mishandling of data collected by state and federal agencies.

* * *

Learning a Living Across the Nation. Volume 3. Project Baseline Third National Report. Baseline Year: 1972-1973 (Fiscal Year 1973). Part 1: Narrative Report. Arthur M. Lee. Flagstaff: Northern Arizona University, November 1974, 108 pp. (ED 099 68[illegible]

Learning A Living Across the Nation. Volume 3. Project Baseline Third National Report. Baseline Year: 1972-1973 (Fiscal Year 1973). Part 2: Statistical Almanac. Arthur M. Lee. Flagstaff: Northern Arizona University, November 1974, 210 pp. (ED 099 685)

Volume 3 of the Project Baseline reports covers the school year 1972-1973 and is divided into a narrative report of findings (Part 1) and a statistical data report (Part 2) on which the narrative is based. The first chapter of the narrative report contains a summary of significant findings based on the data, suggested implications for policy making, and these recommendations:

- New federal legislation for 1975 should include provisions for states to equalize vocational education opportunities for all.
- Federal spending priorities, as they affect vocational education, manpower training, unemployment, and welfare, should be re-examined.
- Congress should include in the legislation for 1975 a set of vocational education definitions, allowing for flexibility and, at the same time, providing for national standardization of terminology.
- A new reporting system should be established for both vocational education and manpower training in which data elements in machine readable form can be transmitted from local to state to federal level for computer tabulation and analysis at each level.

* * *

Learning A Living Across the Nation. Volume 4. Project Baseline Fourth National Report. Baseline Year: 1973-1974 (Fiscal Year 1974). Part 1: Narrative Report. Arthur M. Lee. Flagstaff: Northern Arizona University, December 1975, 144 pp. (ED 120 470)

Learning A Living Across the Nation. Volume 4. Project Baseline Fourth National Report. Baseline Year: 1973-1974 (Fiscal Year 1974). Part 2: Statistical Almanac. Arthur M. Lee and Dorris Fitzgerald. Flagstaff: Northern Arizona Unierstiy, October 1975, 111 pp. (ED 120 471)

The fourth year Project Baseline data published in two parts provides a narrative report in Part 1 and a statistical data report in Part 2. A question and answer format is used to discuss vocational education enrollment, expenditures, placements, instructional personnel, support services, and manpower data for the 1973-1974 reporting period. Chapter 3 reviews the impact of vocational education research and demonstration efforts, including a review of 28 state-administered research projects (Part C), 16 federally administered exemplary projects (Part D), and 12 state-administered exemplary projects, all of which have had extended use.

While considerable improvements in the reporting of vocational education data over the previous years is noted, persisting problems resulting from the lack of a nationally standardized set of definitions and inconsistent handling of data are pointed out. A review of information systems currently in use in each state is included along with a report of a special task force effort to bring uniformity to definitions of key terms used in reporting data, including the term "vocational education."

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Learning A Living Across the Nation. Volume 5. Project Baseline Fifth National Report. Baseline Year: 1974-1975 (Fiscal Year 1975). Part 1: Narrative Report. Arthur M. Lee. Flagstaff: Northern Arizona University, November 1976, 188 pp. (ED 137 505)

Learning A Living Across the Nation. Volume 5. Project Baseline Fifth National Report. Baseline Year 1974-1975 (Fiscal Year 1975). Part 2: Statistical Almanac. Arthur M. Lee and Dorris Fitzgerald. Flagstaff: Northern Arizona University, November 1976, 136 pp. (ED 137 551)

The fifth-year Project Baseline report is divided into two parts, with the narrative report contained in Part 1 and the statistical data contained in Part 2. A question and answer format is used in presenting graphs and tables showing enrollment, expenditures, and trends in instructional personnel in vocational education from 1970-1975. A discussion of accountability difficulties due to the lack of adequate data concludes with a recommendation for a management information system that would detail to the public and to policy makers who is being trained and for what role, where the training is being given, how much it costs, and what the results are. Data elements that should be included in such a reporting system are described and suggestions made include (1) the deletion of adult education as a level of vocational education and the use of grade levels K-14 to replace it; (2) the omission of traditional occupational service areas as data elements and use of a refined Office of Education code taxonomy of courses and job titles that will result in reporting data according to a taxonomy of programs and groups of job titles.

Among the general observations resulting from Project Baseline's five-year study of vocational education are the following:

- Vocational education enrollments have increased nationally.
- Vocational education has not expanded for the disadvantaged and handicapped at the same rate as for other students.
- Cooperative and work study programs have reached only a fraction of their potential enrollment.
- Performance of the states varies widely on all measurements.

- In proportion to total population, women and ethnic minority groups have a greater representation in vocational education than other segments of the population.
- Approximately half of the high school population is reported as being enrolled in vocational education.
- Employment rates for vocational education program completers available for work is higher than for comparable age groups in the total labor force.
- In comparison with state and local support, the federal share of vocational education expenditures has steadily declined.
- The enrollment of manpower training programs under the U. S. Department of Labor is less than five per cent of the reported enrollment in vocational education.
- There is a serious shortage of vocational education teachers.
- Research has had an important impact on program development in vocational education since 1963.
- While state and federal reporting has improved, there are still reporting problems that need to be solved.

A series of Project Baseline Supplemental Reports published between 1974 and 1976 include the following titles:

> Appraisal of the Manpower Training Programs Established by Congress in the 1960s. Project Baseline Supplemental Report. George L. Brandon. Flagstaff: Northern Arizona University, August 30, 1974, 97 pp. (ED 099 691)
>
> Assessing Vocational Education Research and Development. Project Baseline Supplemental Report. Committee on Vocational Education Research and Development. Washington, D.C.: National Academy of Sciences, 1976, 138 pp. (ED 128 654)

Career Education in the United States Today: What It Is, Where, and the Results So Far. Project Baseline Supplemental Report. Robert M. Worthington. Flagstaff: Northern Arizona University, June 28, 1974, 55 pp. (ED 099 693)

Impact of Vocational Education and Manpower Training on Target Populations: Ethnic Groups, the Disadvantaged, Handicapped, Unemployed, and Unemployable Adults. Project Baseline Supplemental Report. James E. Wall. Flagstaff: Northern Arizona University, July 31, 1974, 54 pp. (ED 099 686)

Impact of Vocational Education and Manpower Training on the Labor Market. Project Baseline Supplemental Report. Gordon F. Law. Flagstaff: Northern Arizona University, August 1, 1974, 52 pp. (ED 099 692)

Impact of Vocational Education Research at the Federal and State Levels. Project Baseline Supplemental Report. Robert Miller. Flagstaff: Northern Arizona University, October 25, 1974, 140 pp. (ED 099 687)

Preparation of Teachers for Vocational Education. Project Baseline Supplemental Report. Gordon I. Swanson. Flagstaff: Northern Arizona University, September 1974, 34 pp. (ED 099 690)

Report to the Nation on Vocational Education. Project Baseline Supplemental Report. Mary L. Ellis. Flagstaff: Northern Arizona University, November 1975, 125 pp. (ED 116 052)

Women in Vocational Education. Project Baseline Supplemental Report. Marilyn Steele. Flagstaff: Northern Arizona University, October 30, 1974, 154 pp. (ED 099 689)

Vocational Education Planning in the States: Project Baseline Supplemental Report. Patrick J. O'Reilly. Flagstaff: Northern Arizona University, December 1975, 60 pp.

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National Longitudinal Study [of the High School Class of 1972]. Review and Annotations of Study Reports. Samuel S. Peng, Celcille E. Stafford, and Robin J. Tolbert. Durham, North Carolina: Center for Educational Research and Evaluation, Research Triangle Institute, Research Triangle Park, May 1977, 78 pp.

The stated purpose of this publication was to "establish an inventory of studies" that used the National Longitudinal Study (NLS/72) of the High School Class of 1972 data base so that an exchange of ideas among users might take place and areas needing further investigation could be identified. Monitored and primarily funded by the National Center for Education Statistics, the NLS/72 focuses on the educational, vocational, and personal development of high school graduates and on the various personal, social, and cultural factors contributing to that development.

The study began in the spring of 1972 with a national probability sample of 19,136 seniors from 1,070 public, private, and church-affiliated high schools. Added to the base-year sample were another 4,315 students of the class of 1972 from 248 schools that had been unable to participate in the earlier survey. Each student was asked to complete a student questionnaire and to take a 69-minute test battery. Survey administrators were asked to complete a student record form and a school questionnaire, and school counselors were asked to complete a special questionnaire designed to provide data about their training and experience.

The first follow-up began in October 1973, the second in October 1974, and the third in October 1976. The data files for the base year and the first and second follow-up surveys have been merged and have been used by researchers to investigate various educational, vocational, and social issues.

Chapter 2 describes the NLS/72 data base and data coverage in terms of content areas and time frame in which variables were measured. Findings from the various analyses of the NLS/72 data are summarized in Chapter 3 and include the following:

- The NLS/72 sample represents about three million high school seniors in 1972 made up of 82 per cent white, 9.5 per cent black, and 8.5 per cent from other minority groups.

- A quarter of the black students and about half of the white students were enrolled in academic programs.

- Half of the black students and 29 per cent of the white students were enrolled in general programs.
- A quarter of the black students and about 20 per cent of the white students were enrolled in vocational programs.
- Both vocational and general students had lower scores than academic students on the academic ability tests.
- Compared to general education students, vocational education students achieved higher grades, were less alienated toward school, and were more focused in their post-secondary work aspirations.
- Job training received in high school correlated positively with occupational attainment and income after graduation. Participants were more likely to be employed and had a higher median income than non-participants.

An annotated bibliography of over 150 documents pertaining to the NLS/72 data is presented in Chapter 4, with names and addresses of data file users appearing in the index. Following is a partial listing of NLS/72 publications:

Changes in Attitudes One and One-Half Years After Graduation. William B. Fetters. Washington, D.C.: National Center for Education Statistics, 1974, 14 pp. (ED 117 155)

National Longitudinal Study of High School Seniors. An Agenda for Policy Research. Stephen J. Carroll and Peter A. Morrison. Santa Monica: Rand Corporation, June 1976, 80 pp. (ED 135 818)

National Longitudinal Study of High School Seniors. Fulfillment of Short-Term Educational Plans and Continuance in Education. William B. Fetters and others. Washington, D.C.: National Center for Education Statistics, 1977, 42 pp.

National Longitudinal Study of the High School Class of 1972. Base-Year Study: Student Questionnaire and Test Results by Academic Ability, Socioeconomic Status and Region. William B. Fetters. Washington, D.C.: National Center for Education Statistics, 1976, 106 pp. (ED 120 252)

National Longitudinal Study of the High School Class of 1972. Capsule Description of First Follow-up Survey Data. B. K. Eckland and J. P. Bailey. Research Triangle Institute. Durham, North Carolina: Research Triangle Institute, Center for Educational Research and Evaluation, 1976, 47 pp. (ED 120 251)

National Longitudinal Study of the High School Class of 1972. Capsule Description of High School Seniors. Base-Year Survey. William B. Fetters. Washington, D.C.: National Center for Educational Statistics, 1974, 43 pp. (ED 097 368)

National Longitudinal Study of the High School Class of 1972. Capsule Description of Second Follow-up Survey Data. October 1974. Bruce K. Eckland and J. P. Bailey, Jr. Durham, North Carolina: Research Triangle Institute, Center for Educational Evaluation and Research, 1977, 62 pp. (ED 139 826)

National Longitudinal Study of the High School Class of 1972. Comparative Profiles One and One-Half Years After Graduation. William B. Fetters. National Center for Education Statistics, 1975, 68 pp. (ED 120 202)

National Longitudinal Study of the High School Class of 1972. Counselor Questionnaire. Educational Testing Service. Princeton: Educational Testing Service, 1972, 8 pp. (ED 097 371)

National Longitudinal Study of the High School Class of 1972. First Follow-up Survey Design, Instrument Preparation, Data Collection, and File Development. Kenneth Tabler. Washington, D.C.: National Center for Education Studies, 1977, 48 pp. (ED 141 406)

National Longitudinal Study of the High School Class of 1972. Parent's Questionnaire. Educational Testing Service. Princeton: Educational Testing Service, 1973, 7 pp. (ED 097 370)

National Longitudinal Study of the High School Class of 1972. Sample Design Efficiency Study: Effects of Stratification, Clustering and Unequal Weighting on the Variances of NLS Statistics. William B. Fetters. Washington, D.C.: National Center for Education Statistics, 1977, 26 pp. (ED 146 189)

National Longitudinal Study of the High School Class of 1972. Student Questionnaire. Educational Testing Service. Princeton: Educational Testing Service, 1972, 26 pp. (ED 097 369)

National Longitudinal Study of the High School Class of 1972. Student Questionnaire and Test Results by Sex, High School Program, Ethnic Category, and Father's Education. William B. Fetters. Washington, D.C.: National Center for Education Statistics, 1975, 127 pp. (ED 111 850)

National Longitudinal Study of the High School Class of 1972. Student's School Record Information. Education Testing Service. Princeton: Educational Testing Services, 1972, 6 pp. (ED 097 372)

National Longitudinal Study of the High School Class of 1972. Symposium: Trends in Post-secondary Education. J. P. Bailey, Jr., ed. Washington, D.C.: American Educational Research Association, April 1977, 100 pp. (ED 142 126)

National Longitudinal Study of the High School Class of 1972. Tabular Summary of the First Follow-up Questionnaire Data. Kenneth Tabler. Durham, North Carolina: Research Triangle Institute, 197[illegible], 965 pp. (ED 143 677)

National Longitudinal Study of the High School Class of 1972. Tabular Summary of Student Questionnarie Data. Volume 1. (Questiona 1-37). Bruce W. Thompson. Princeton: Educational Testing Service, 1974, 459 pp. (ED 103 452)

National Longitudinal Study of the High School Class of 1972. Tabular Summary of Student Questionnaire Data. Volume 2. (Questions 38-95). Bruce W. Thompson. Princeton: Educational Testing Service, 1974, 475 pp. (ED 103 453)

One and One-Half Years After High School Graduation: The Class of 1972. National Center for Education Statistics. Washington, D.C.: National Center for Education Statistics, June 1975, 5 pp. (ED 110 730) (Journal citation: Advanced Statistics for Management Bulletin, No. 21, June 16, 1973)

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National Longitudinal Surveys Handbook. Herbert S. Parnes. Columbus: Center for Human Resource Research, The Ohio State University, Revised November 1977, 87 pp.

Since 1966, National Longitudinal Surveys (NLS) have been conducted to gather data on the labor market experience and other characteristics of men 45-59 years old and young men 14-24. In 1967 a third group, women 30-44, was added; and in 1968 a fourth group, young women 14-24, was added to the study. The NLS project, sponsored by the U.S. Department of Labor, is carried out by The Ohio State University's Center for Human Resource Research (Dr. Herbert Parnes, Project Director). Studies utilizing NLS data (see list of titles below) attempt to identify characteristics that appear to be most important in explaining variations in employment, unemployment, and labor force mobility. National probability samples of approximately 5,000 were drawn to represent each group; and personal interviews in addition to mail and telephone surveys have been made periodically. Because of the widespread interest in the data and low attrition rates within the groups, the decision was made to increase the extent of the surveys, from the original period of 5 years, to 15 years. Final interviews are scheduled in 1981 for the older and younger men, 1982 for the older women, and 1983 for the young women.

Volumes reporting findings from surveys already conducted are cited in Category 1 under the following titles:

Career Thresholds: A Longitudinal Study of the Educational and Labor Market Experience of Male Youth. Volumes 1-6.

Dual Careers: A Longitudinal Study of Labor Market Experience of Women. Volumes 1-4.

Pre-Retirement Years: Five Years in the Work Lives of Middle-Aged Man. Volumes 1-4.

Years for Decision: A Longitudinal Study of the Educational and Labor Market Experience of Young Women. Volumes 1-4.

Surveys scheduled for a newly developed panel of young men and young women (with the first survey scheduled for January 1979) are expected to enable replication of analyses made of earlier cohorts and will help evaluate the expanded employment and training programs of the late 1970s.

The Handbook describes NLS sampling, interviewing, and estimating procedures and provides a table of survey schedules and a listing of variables investigated in the surveys for each of the groups. Characteristics of the data files are described, and information is provided on how to obtain data tapes. A National Longitudinal Surveys Bibliography of approximately 300 entries provides a list of the comprehensive and special reports generated as a result of the surveys.

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The Pre-Retirement Years: A Longitudinal Study of the Labor Market Experience of the Cohort of Men 45-59 Years of Age. Volume 1. Herbert S. Parnes, Belton M. Fleisher, Robert C. Miljus, and Ruth S. Spitz. Columbus: Center for Human Resource Research, The Ohio State University, October 1968, 303 pp. (ED 026 525)

This report is the first in a study of labor market experience and behavior of men who were 45 to 59 years of age in 1966. Data gathered from a national probability sample of 5,000 men relative to economic, social, and psychological variables are analyzed in an attempt to describe and explain differences in labor force participation, commitment to work, propensity to retire, rates of pay, and job satisfaction.

Other volumes reporting survey data from the same sample through 1971 are these:

The Pre-Retirement Years: A Longitudinal Study of the Labor Market Experience of Men. Volume 2. Herbert S. Parnes and others. Columbus: Center for Human Resource Research, The Ohio State University, January 1970, 122 pp. (ED 039 331)

The Pre-Retirement Years: A Longitudinal Study of the Labor Market Experience of Men. Volume 3. Herbert S. Parnes and others. Columbus: Center for Human Resource Research, The Ohio State University, August 1972, 151 pp. (ED 068 682)

The Pre-Retirement Years: Five Years in the Work Lives of Middle-Aged Men. Volume 4. Herbert S. Parnes and others. Columbus: Center for Human Resource Research, The Ohio State University, December 1974, 425 pp. (ED 103 052)

Additional surveys of the men in this group were conducted in 1973, 1975, 1976, and 1978 and are scheduled for 1980 and 1981.

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Project Talent. The American High School Student. John C. Flanagan, Frederick B. Davis, John T. Dailey, Marion F. Shaycoft, David B. Orr, Isadore Goldberg, and Clinton A. Neyman, Jr. Pittsburgh: University of Pittsburgh, 1964, 738 pp.

One of the major publications in a series of Project TALENT reports published since 1960, this volume describes the effort to determine the aptitudes and abilities of the nation's high school students. In 1960 a probability sample of over 440,000 students in the 9th , 10th, 11th, and 12th grades in 987 randomly selected high schools across the country were administered a comprehensive set of educational and psychological tests and inventories. The more than 2,000 items included were intended to produce information that would describe talents, help to establish standards, and lead to identification of aptitude and ability patterns predictive of success in various careers.

The follow-up surveys scheduled one, five, ten, and twenty years following the year of graduation for each class were planned to trace the careers of the students in a continuing effort to maintain an updated data bank on the original sample.

Previously published Project TALENT publications provide detailed information on the Project's basic plans, the instruments used in the survey, and the characteristics of American high schools.

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Project Talent Data Bank: A Handbook. David V. Tiedeman. Palo Alto, California: American Institutes for Research, April 1972, 119 pp.

This publication is intended to provide researchers interested in the Project TALENT Data Bank an overview of the Project's purpose, measures, sampling, weighting, and follow-up procedures in addition to information about the special data files available for further study. Services available from the Institute include printouts, worktapes, and contract research. Hypothetical examples of the kinds of projects made possible through the use of Project TALENT data, as well as actual projects which have used the data bank between 1964 and 1971,are summarized in the appendix to the *Handbook*. A list of Project TALENT publications through 1971 is also provided.

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Project Talent One-Year Follow-up Studies. John C. Flanagan and William W. Cooley. Pittsburgh: University of Pittsburgh, 1966, 387 pp. (ED 101 087)

This report describes the follow-up procedures used and the data gathered from mail surveys of the original Project TALENT sample of over 440,000 high school students undertaken one year following graduation of each of the high school classes from 1961 to 1964. Data on the schools they attended, the jobs they held, the careers they planned, and choices they made are reported and related to information collected from the 1960 survey in an effort to determine how young people choose careers and how educational experiences prepare them for those careers.

The final chapter describes the use of a computer measurement system by guidance programs to maintain cumulative and progress records, to evaluate educational productivity of curriculum and staff, to project vocational potentials for students, to monitor and prescribe individual learning, and to manage continuation services to graduates and school-leavers. The reference section includes a listing of Project TALENT publications, published articles, and research reports delivered by staff members at professional meetings.

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Years for Decision: A Longitudinal Study of the Educational and Labor Market Experience of Young Women. Volume 1. John R. Shea, Roger D. Roderick, Frederick A. Zeller, and Andrew I. Kohen. Columbus: Center for Human Resource Research, The Ohio State University, February 1971, 245 pp. (ED 049 376)

Data gathered in the initial 1968 National Longitudinal Survey of a representative sample of 5,000 young women 14 to 24 years of age is analyzed and reported in this first of four volumes published under the title Years for Decision. Marital and familial characteristics, financial status, education and training, health condition, attitudes and the labor market are examined as explanatory variables and then related to labor force participation, unemployment, mobility, and educational and occupational aspirations of the young women.

The data show that the years between 14 and 24 are critical for young women faced with pressures and options: whether to continue or to leave school, whether or not to get married, whether to stay with parental family or to develop independence. While these decisions are recognized to be interrelated with decisions about education and work, causal relationships are unclear.

Findings from the initial survey include the following:

- Approximately 70 per cent of the young women 14 to 17 years of age enrolled in school say they would like two or more years of post-secondary schooling.
- The highest level of school completed is related to the occupational assignments and the hourly rate of pay of the young women who are employed.
- Shorthand and/or typing skills acquired in high school and occupational training outside the formal school are related to employment generally and white-collar employment specifically.
- Marital and family status have a direct influence on a woman's occupational assignment and is interrelated with such factors as educational attainment and health.

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Years for Decision: A Longitudinal Study of the Educational and Labor Market Experience of Young Women. Volume 2. Roger D. Roderick and Joseph M. Davis. Columbus: Center for Human Resource Research, The Ohio State University, March 1973, 144 pp. (ED 076 812)

This volume investigates the extent to which changes occurred in the educational and labor market status and aspirations of young women during the year following the original interview. The following findings resulted from the 1969 interviews:

- The dropout rate for young white women was comparable to that shown for young white men between 1966 and 1976 (NLS, Career Thresholds), but the dropout rate for young black women at the high school level exceeded that of their male counterparts.
- The percentage of young women revising their educational goals downward was similar to that of young men; however, in contrast to the young men, who reported economic factors as the reason for revising goals, young women most often cited changes in "interest."
- For young women out of school on both survey dates who had completed exactly 12 years of school, those who had been enrolled in vocational or commercial programs made the greatest gains in rate of pay during the year, while those from general curricula made the smallest.
- Job changes were related to higher hourly earnings and increased job satisfaction.
- As measured by the occupational information test used in the survey, white young women have substantially more labor market knowledge than black young women--a variation that persists even after controlling for educational attainment and mental ability.

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Years for Decision: A Longitudinal Study of the Educational and Labor Market Experience of Young Women. Volume 3. Roger D. Roderick and Andrew I. Kohen. Columbus: Center for Human Resource Research, The Ohio State University, December 1973, 111 pp. (ED 094 135)

The third volume in the series of reports examining labor market and educational experiences and aspirations of young women includes data gathered in the 1970 interviews with the young women 14 to 24 years of age at the time of the initial survey in 1968. Included in the data were the following findings:

- The young women continued to revise their goals, bringing them more in line with "reality."
- Expected levels of educational attainment dropped slightly.
- Forty per cent of the young women had changed their plans for age 35, overwhelmingly in the direction of employment at that age.
- Approximately 20 per cent of those who had never been married in 1968 were married in 1970, and more than 10 per cent who had been childless in 1968 had at least one child by 1970.
- Interfirm changes in employment were related to change in occupation, increase in hourly wage, and job satisfaction.

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Years for Decision: A Longitudinal Study of the Educational and Labor Market Experience of Young Women. Volume 4. Frank L. Mott, Steven H. Sandell, David Shapiro, Patricia K. Brito, Timothy J. Carr, Rex C. Johnson, Carol L. Jusenius, Peter J. Koenig, and Sylvia F. Moore. Columbus: Center for Human Resource Research, The Ohio State University, November 1977, 366 pp. (ED 147 540)

The research studies in this volume indicate that a substantial portion of young women, represented by those who were 14 to 24 years of age in 1968, will spend a major part of their lives in the labor force. Most women continue to plan careers in traditionally female positions and as a result continue to occupy lower paying positions than those occupied by men.

Findings of the six studies reported in this volume include the following:

- Parental factors directly affect a young woman's educational experiences and have a significant effect on the types of career path she plans to follow.
- A young black woman with socioeconomic background characteristics similar to the average white young woman is more likely to have college aspirations and is also more likely to attend college than her white counterpart.
- There is evidence that women committed to the labor force are willing to accept low initial wages as a price for job training promising higher lifetime earnings.
- Marriage disruption increases the likelihood that young women will enter the labor force.
- Non-participation in the labor force associated with childbirth increasingly tends to be brief.

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Youth in Transition. Volume 1. Blueprint for a Longitudinal Study of Adolescent Boys. Jerald G. Bachman, Robert L. Kahn, Martha T. Mednick, Terrence N. Davidson, Lloyd D. Johnston. Ann Arbor: Institute for Social Research, University of Michigan, 1967, 274 pp. (ED 026 463

This first in a series of six volumes summarizes the plans for the six-year longitudinal study of a national sample of approximately 2,200 young men in 87 high schools. The first data collection in the fall of 1966 was made when the boys were in the 10th grade. Follow-up surveys were conducted in the spring of 1968, the spring of 1969, and in June and July 1970 when most of the boys had been out of high school for about a year. Volume 1 contains descriptions of study design, sampling procedures, response rates, and questionnaires.

Following are titles of other volumes in the series:

Youth in Transition. Volume 2. The Impact of Family Background and Intelligence on Tenth-Grade Boys. Jerald C. Bachman. Ann Arbor: Institute for Social Research, 1970, 293 pp. (ED 051 414)

Youth in Transition. Volume 3. Dropping Out--Problem or Symptom? Jerald C. Bachman and others. Ann Arbor: Institute for Social Research, University of Michigan, 1971, 255 pp. (ED 059 333)

Youth in Transition. Volume 4. Evolution of A Strategy for Longitudinal Analysis of Survey Panel Data. Terrence N. Davidson. Ann Arbor: Institute for Social Research, University of Michigan, 1972, 130 pp. (ED 064 440)

Youth in Transition. Volume 5. Young Men and Military Service. Jerome Johnston and Jerald C. Bachman. Ann Arbor: Institute for Social Research, University of Michigan, 1972, 259 pp. (ED 072 185)

Youth in Transition. Volume 6. Adolescence to Adulthood: Change and Stability in the Lives of Young Men. Jerald C. Bachman and others. Ann Arbor: Institute for Social Research, University of Michigan, 1978, 351 pp.

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Category 2: REVIEW AND SYNTHESIS PAPERS

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[1] Complete bibliographic citations for these titles, along with supplementary information are provided with annotations on the pages that follow.

Evaluation of Vocational Technical Education. Phase I. New Educational Directions, Inc. Indianapolis: The Indiana State Board of Vocational Technical Education, July 1975, 25 pp.

Using responses from State Departments of Public Instruction and information resulting from an ERIC search, this document reports on the status of evaluation activities by the various states according to these categories: self-study, visiting team, follow-up of students, employer and/or community evaluation, cost/benefit analysis, behavioral objectives, non-behavioral objectives, and job-placement relatedness.

The report concludes that regardless of the method, or combination of methods, used for evaluating a particular school or program, it is of primary concern that the evaluation system meet the needs of the school or program in that it results in a cooperative effort to implement the findings. A bibliography of 261 citations is included.

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Program Evaluation in Vocational Education: A Review. Information Series No. 117. Floyd McKinney. Columbus: The Center for Vocational Education, The Ohio State University, 1977, 41 pp. (ED 149 186)

The author points out that even though it is generally agreed that the evaluation of vocational education programs is necessary for better decision-making, for various reasons a comprehensive and systematic approach to program evaluation has been slow to develop.

In this review of literature on evaluation of vocational education since 1970, reference is made to several conceptual schemes and models that have been used typically in program evaluation by researchers and education agencies.

Since it is reasoned that identifying needs--as may be reflected in program objectives--is basic to an evaluation effort, a discussion of several needs-assessment surveys is included, providing suggestions for sampling techniques and questionnaire content. Summarized strategies for conducting former student follow-ups, employer surveys, student-parent surveys, and cost-benefit studies contain procedural checklists and suggestions for those considering these kinds of studies.

In a discussion of management information systems, specific reference is made to the systems that have been developed for Florida, Massachusetts, and Tennessee.

Studies carried out by the Kentucky, South Carolina, Oklahoma, Washington, and Florida State Advisory Councils are summarized; and it is noted that while most state advisory councils use existing data in the preparation of their annual reports, several have also initiated special research and cost-benefit analysis studies. The U.S. Office of Education, the American Vocational Association, the departments of vocational education in each state, and various national, regional, and professional accrediting agencies are cited as additional sources of standards, sample questionnaires, and guidelines for use in measuring and assessing program characteristics and other aspects of vocational education.

Based on his review of the literature and experience in vocational education program evaluation, the author has arrived at the following conclusions

- While "one-shot" evaluation efforts in vocational education have some value, program evaluation should be a comprehensive and continuous effort.
- While more emphasis should be placed on cost analysis studies, it should be realized that such studies leave out important subjective factors that every decision-maker must consider.
- Institutions and agencies need to devote more resources to developing program objectives since measurable objectives are essential to program evaluation.
- Research in all areas of methodology is needed.
- Since program evaluation depends on a continuous flow of reliable and valid information, systematic and comprehensive information collection is needed.

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Review and Synthesis of Cost-Effectiveness Studies of Vocational and Technical Education. Information Series No. 57. Ernst W. Stromsdorfer. Columbus: The Center for Vocational and Technical Education, The Ohio State University, 1972, 151 pp. (ED 066 554)

The author of this study identifies the non-economist as his intended audience and begins his study with an overview of the use of economic analysis and theory which is fundamental to an understanding of cost-benefit analysis studies. Included in this section of the report is a discussion of optimum allocation of public expenditures for vocational education through an appropriate investment decision rule which considers net present value, internal rate of return, and benefit-cost ratio.

Some of the conceptual and measurement problems that need to be addressed in the analysis of educational investment are pointed out: earnings versus utility maximization, non-market production and consumption, impact of education on values and preferences, complementarity and inseparability of human skills, external effects, influence of unemployment on the determination of costs and benefits, and the problems of the control group.

Drawn primarily from studies, papers, reports, and monographs published in the 1960s that attempt to evaluate vocational and manpower training programs, the report states that relatively few were found that dealt adequately with the investment aspects of the programs. Problems with interpreting the implications of cost-benefit studies evolve from weaknesses in methodology such as lack of control or appropriate comparison groups, inadequate sampling and non-response procedures, failure to deal with self-selection bias, failure to use sophisticated procedures for the analysis of data, and failure to establish, beforehand, acceptable levels of statistical significance.

Following are some of the conclusions drawn by the author as a result of his review:

Secondary Vocational Education: Based on evidence from studies, secondary vocational curriculum seems to yield greater labor market benefits than the comprehensive curriculum. Consideration needs to be given, however, to the dissimilarity of objectives and populations served by the curricula. Cost-benefit measures which compare sets of vocational skills are lacking, and information on gross earnings or wage differentials by skills loses its usefulness in the absence of cost information.

Post-Secondary Vocational Education and Junior College: For students who already have a sound high school vocational preparation, further post-secondary vocational education does not yield substantial benefits. While greater benefits are associated with graduation from junior college than from secondary vocational education training, the existence of objective and population differences need to be taken into consideration when the data are interpreted.

Manpower training: Results of studies of training programs in this category indicate they are a worthwhile investment but causal factors have not been isolated. Manpower training is viewed as a necessary complement to vocational education training when consideration is given to the rapid changes in technology and the differences in the populations served by the two programs.

The report suggests that in spite of limitations, cost-benefit studies provide a rational, systematic approach to the economic analysis of programs designed to improve efficiency of the labor force and to increase the overall welfare and well-being of society. However, costs of well-designed, comprehensive studies will continue to limit the widespread use of this form of program evaluation.

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Review and Synthesis of Research on Cooperative Vocational Education. Research Series No. 60. Harold R. Wallace. Columbus: The Center for Vocational and Technical Education, The Ohio State University, June 1970, 124 pp. (ED 040 274)

The research topics covered by this review of studies and literature published between 1962 and 1969 are arranged into four categories with a corresponding bibliography topically arranged. There are four focus areas:

- The Student Learner: This section includes a review of research concerned with self-concept, work adjustment, and special needs--data that may be considered as input for curriculum development and implementation in cooperative vocational education.
- The Employment Community: Manpower analysis studies, manpower data sources, task analysis models, and occupational analysis studies are reviewed in this section.
- Educational Technology: Procedures, products, and problems of research dealing with instructional objectives and content are discussed,

and a review of selected research concerned with teaching techniques and procedures is included.

- Program Implementation: This section reviews research and literature dealing with program administration and evaluation.

Few of the studies reported dramatic evidence of the value of one instructional technique or one instructional system over another. Reasons identified were the lack of pre-test/post-test instruments, techniques and procedures sensitive to measuring what should be measured, and inadequate design of research studies that control for intervening variables. The author reports that the most successful studies investigated a single factor and provided obviously similar situations for the experimental and control subjects.

The author concludes that the basic concepts of cooperative vocational education need to be logically organized, articulated, and subjected to systematic theory building, leading to the establishment of general guidelines. Research needs and priority areas identified by the author include the following:

- A theoretical and philosophical framework for research and development in vocational education
- Interpretation dissemination systems for manpower data to be used by program developers
- Research technology to provide for the transformation of occupational analysis data into instructional objectives
- Techniques and instruments for the evaluation of instruction
- Study of the contribution of occupational experiences to professional training and the impact of teacher-coordinator characteristics on the behavior of the student-learner
- Research involving psychological constructs such as "work values" and "personal adjustment"
- Dissemination of research and development products

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- Research involving psychological constructs such as "work values" and "personal adjustment"
- Dissemination of research and development products

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Review and Synthesis of Research on the Economics of Vocational Education. Research Series No. 16. J. Robert Warmbrod. Columbus: The Center for Vocational and Technical Education, The Ohio State University, November 1968, 62 pp. (ED 023 937)

The documents included in this review, published between 1962 and 1968, identify issues and problems in research on the economics of vocational education. The point is made that while there has been general agreement that education is a vital element in economic growth, the relative contributions of occupational programs and various other educational programs have not been clearly shown.

A discussion of the research investigating education as it is related to earnings, rate of return on investment, economic growth, and external benefits is followed by a similar but more extensive treatment of research on the economic aspects of vocational education. The author points out that since there is concern not only for the efficient use of resources allocated to vocational education but also for consideration of alternative programs to reach the same objective, costs of programs must be justified on the basis of outcomes. Several approaches and techniques for measuring these outcomes are discussed; and specific studies and critiques of studies using cost-benefit and cost-effectiveness procedures in analyzing vocational education, technical education, and manpower training programs are described. Conceptual and practical problems involved in the application of cost-benefit analysis to vocational education are pointed out, and the suggestion is made that those who plan research in this area become familiar with the issues and problems discussed in the studies reviewed.

The author contends that the usefulness of cost-benefit analysis as an evaluative technique in vocational education is limited by the requirement that benefits, as well as costs, be quantitatively assessed in monetary terms. He suggests that cost-effectiveness analysis is more appropriate since it takes into account non-economic as well as economic benefits. The author concludes that research pertaining to the effectiveness of vocational education would be enhanced by greater joint efforts on the part of vocational educators and economists.

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Review and Synthesis of Research on the Placement and Follow-up of Vocational Education Students. J. Kenneth Little. Columbus: The Center for Vocational and Technical Education, The Ohio State University, February 1970, 54 pp. (ED 037 543)

The author characterizes the studies reviewed as a cross section of follow-up research reported between 1964 and 1969. Major fields covered in the studies include vocational education at the secondary, post-secondary, and adult levels. Special groups examined by the studies are Manpower Development and Training program graduates, correctional institution inmates, military trainees, the older worker, and program early-leavers. One section of this report focuses on follow-up studies of vocational education graduates by program area--agriculture education, distributive education, health occupations, home economics, office occupations, technical occupations, and trade and industrial programs.

Among the findings reported are the following:

- Programs in vocational education are serving important segments of the population in areas not otherwise reached.
- Those who move directly to jobs from vocational training have an advantage in earnings over untrained cohorts.
- Most vocationally trained persons like their jobs, especially if they find jobs for which they have been specifically trained.
- The majority of vocationally trained high school graduates obtain employment near the communities in which they receive their training.
- Graduates obtained their jobs primarily through their own efforts or those of friends and relatives.
- In general, graduates from post-high school training programs have a clear employment advantage over high school program graduates.
- While there is evidence that vocational programs are probably worth their cost, this finding does not hold for all vocational programs, in all places, or in all fields.

The report concludes with these suggestions:

- Follow-up and placement studies should be a component of the evaluation of educational programs.
- A systems approach should be used in evaluating educational programs, with purposes defined, outcomes described, criteria developed, and research designs adapted accordingly.
- Research is needed on employed persons who have acquired occupational skills and resulting employment through non-school activities.
- There is a need for more studies to which sophisticated statistical analysis can be applied.

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A Synthesis of Research Findings Which Describe Selected Benefits and Outcomes for Participants in Vocational Education. Doug Sparks. Washington, D.C.: Bureau of Occupational and Adult Education, Department of Health, Education and Welfare, October 1977, 48 pp.
(ED 147 576)

The stated purpose of this study is to identify and explore selected benefits of vocational education. The findings of two categories of studies are explored--major national studies and studies or reports from states or institutional sources. Data reported in these studies were gathered, for the most part, after 1970.

Project Metro, the National Longitudinal Study of the High School Class of 1972, and Project Baseline are among the national studies examined. State and institutional studies and reports reviewed include an Arkansas follow-up study of 1970 graduates from eight high schools, A Five-

Year Follow-Up of Students Enrolled in Post-Secondary Vocational-Technical Transfer Programs by Noeth and Hanson, an Ohio school district study, and a Massachusetts study of male high school graduates. Vocational education benefits examined include post-secondary schooling status and economic satisfaction values, viewed in terms of student satisfaction with education and employment and employer satisfaction with employees.

The author points out difficulties encountered in interpreting follow-up studies due to arbitrarily set intervals of time used for gathering data from program graduates and inconsistencies in reporting categories from one state to another, in definitions of terms, in sampling techniques, and in non-response bias.

With these shortcomings acknowledged, the author offers these conclusions:

- Vocational graduates economically are doing as well as or better than graduates of other curricula.
- Vocational graduates are often more satisfied with their jobs than academic and general graduates.
- Vocational graduates consider their training an important contributing factor to job procurement.
- Vocational students who wish to continue education find openings available to them.
- Vocational education provides assistance to segments of society not adequately served by academic or general education.

Two projects not discussed but noted by the author are The Development of Sample Designs for the Follow-up of Vocational Education Graduates, conducted by Westat Research, Inc. and aimed at providing sample designs to aid states in conducting follow-up studies, and A Study of the Comparison of the Benefits of Secondary and Post-Secondary Vocational Education, conducted by the Montana State Department of Public Instruction to identify the psychological and sociological benefits of vocational education to students.

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What Happens After Training: A Review of Follow-up of Vocational Graduates. Krishan K. Paul. Nashville: Urban Observatory of Metropolitan Nashville and University Centers, September 30, 1976, 35 pp. (ED 140 010)

The follow-up studies of vocational education graduates published between 1964 and 1975 and reviewed in this document, are arranged into four categories as follows:

- Administrative reports: These are reports required of local, state, or federal administrators which may be based on nationwide or statewide surveys of former vocational students or on less formal inquiry by an instructor of a vocational program. The reports include information about job placement, wages, continuing education, former trainee evaluation of educational and counseling services, and demographics.
- Comparative studies: Research studies which evaluate individual vocational programs by comparing them with other vocational programs or with non-vocational programs are included in this category.
- Cost-benefit analyses studies: Studies are reviewed that evaluate vocational education by calculating costs and benefits in an attempt to measure the increase in welfare or utility as a result of an educational program.
- Procedural studies: This category includes studies related to the development of technology, questionnaires and other instruments, data systems, methodology, and guides and manuals that may be used in carrying out follow-up studies.

The author points out the growing need that states have for follow-up data to measure impact of vocational education on the labor market and the individual trainees. He feels that many of the present studies suffer from procedural and/or conceptual problems, such as inadequate data collection and sampling methods, a lack of adequate measures to assess the economic and non-economic benefits of vocational education, difficulty in separating the impact of non-school activities from educational or vocational activities, and the need for analysis of the relationship between vocational education and economic cycles.

The report recommends sponsorship and encouragement of research efforts at the regional, state, and national level as an essential part of planning and evaluating the development of human resources necessary for industrial and economic development. Two sample follow-up questionnaires are included at the end of the report--one for surveying former vocational students and the other for assessing employer satisfaction with vocational graduate employees.

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Category 3: EVALUATION METHODOLOGY

LIST OF TITLES[1]

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Accountability: Evaluation for Occupational Programs. Milo P. Johnson and Albert J. Grafsky, Jr. American Technical Society, 1973. 207

"Criteria Against Which Vocational Education Should Be Held Accountable," Grant Venn, in *Interpreting Outcome Measures in Vocational Education: A Final Report*. Floyd L. McKinney and others. The National Center for Research in Vocational Education, The Ohio State University, 1979. 208

The Economic Evaluation of Vocational Training Programs. Manuel Zymelman. The Johns Hopkins University Press, 1976. 209

Educational Evaluation and Decision Making. Daniel L. Stufflebeam and others. Itasca, Illinois: F. E. Peacock Publishers, Inc., 1971. 209

Evaluating Occupational Education and Training Programs. Tim L. Wentling and Tom E. Lawson. Allyn and Bacon, Inc., 1975. 210

"Evaluating Vocational Education and Technical Programs," Jerome Moss, Jr. and Ernst W. Stromsdorfer. Chapter 9 in *Vocational Education Today and Tomorrow*, edited by Gerald G. Somers and Kenneth Little. Center for Studies in Vocational and Technical Education, University of Wisconsin, 1971. 211

Evaluating Vocational Education: Polices and Plans for the 1970s.With an Annotated Bibliography. Leonard A. Lecht. Praeger Publishers, 1974. 212

Evaluation of Occupational Education Programs. Jerome Moss, Jr. University of Minnesota, Research Coordination Unit in Occupational Education, September 1968. 213

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[1] Complete bibliographic citations for these titles, along with supplementary information, are provided with annotations on the pages that follow.

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Evaluation of Vocational Technical Education. Phase II. New Educational Directions, Inc. Indianapolis: The Indiana State Board of Vocational Technical Education, May 1976. 214

"Evaluation Research in Vocational Education," J. Robert Warmbrod. *Beacon*, American Vocational Education Research Association, January 1977. 215

A Model for Evaluating Programs in Vocational Education for the Handicapped. Final Report. Gerald Bekker and James E. Christianson. College of Education, Texas A&M University, August 1975. 216

Practices in Program Evaluation: A Survey and Some Case Studies. Samuel Ball and Scarvia B. Anderson. Educational Testing Service, October 1975. 216

System for Statewide Evaluation of Vocational Education. Final Report. Harold Starr and Richard A. Dieffenderfer. The Center for Vocational and Technical Education, The Ohio State University, May 1972. 217

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Accountability: Evaluation for Occupational Programs.
Milo P. Johnson and Albert J. Grafsky, Jr. Chicago:
American Technical Society, 1973, 101 pp. (ED 087 902)

This report addresses the development and utilization of accountability in occupational education and details a variety of methods for measuring educational output and "revising strategies" for improvement. Accountability is defined as "the ability to demonstrate cost-effectiveness (efficient use of resources) in meeting predetermined educational philosophy and goals, (1) when using verified objectives, (2) when serving well-identified students, and (3) when taking into consideration constraints relative to school, course, group of students, and community."

Fifteen goals of the occupational education accountability system are listed and guidelines are offered for preparing goals and objectives for accountability based on a foundation of philosophy. Six measures of instructional output for occupational education are discussed and listed as follows:

- Completion based on passing required minimum work as set forth in the teacher's course outline
- Completion based on measurable objectives which establish minimum standards of acceptable performance
- Units of credit plus grades--each based on measurable objectives and grading criteria
- Completion with the student being adequately trained for employment
- Placement in paid employment in occupation for which training was received
- Follow-ups within first year of graduation, including employer rating of the performance of the student graduate on the job

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"Criteria Against Which Vocational Education Should Be Held Accountable," Grant Venn. In Interpreting Outcome Measures in Vocational Education: A Final Report, Floyd L. McKinney, Kenney E. Gray, and Marie Abram. The National Center for Research in Vocational Education, The Ohio State University, 1979, 250-285 pp.

The author of this chapter suggests that traditional criteria for accountability in vocational education are not relevant to the future and that the continued use of these criteria will result in decreasing the effectiveness of vocational education as a means of preparing individuals for future work just at a time when preparation for work is necessary for everyone and when many are facing changes in work roles. In selecting criteria for accountability, the following points are suggested for consideration:

- Criteria should be relevant to the individual's needs as well as to changing societal problems.
- A search for specific criteria that can be certified "to be right" may prevent the search for more appropriate criteria.
- Criteria selected for accountability in response to student needs, societal problems, and employer concerns are necessary before the evaluation process can be determined.

Four broad categories of criteria were identified as follows: (1) Instructional and program quality; (2) Program relevance to individual and societal needs in relation to work; (3) Program impact on organization, policy, support, and usage of vocational education; and (4) Individual transition to and growth in the work world.

Venn suggests that if these broad areas for criteria of accountability seem appropriate, a national effort to define more specific criteria should be undertaken by a group composed of employers, parents, students, teachers, administrators, policy makers, and legislators.

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The Economic Evaluation of Vocational Training Programs. Manuel Zymelman. World Bank Staff Occasional Paper: No. 21. Baltimore: The Johns Hopkins University Press, 1976, 122 pp.

The author states that the purpose of this study is to provide a methodology for the assessment of vocational training programs that will enable policymakers to evaluate proposals for vocational schools or other forms of training and thereby to choose the most effective program for a particular situation. In particular, the study represents an effort to increase the efficiency of educational and training systems in developing countries.

Advantages and disadvantages of on-the-job, off-the-job, and combined types of training programs are discussed in Chapter 2. A theoretical analysis of factors influencing the choice of a mode of training in Chapter 3 includes a discussion of the economic factors affecting the cost of training. Chapter 4 furnishes data on programs in vocational schools in regard to hours spent in classrooms and in various laboratories, transferability of theoretical and practical instruction, and cost of laboratory equipment in 1972. Appendix B provides an analytic framework and a checklist of variables for reviewing evaluations of vocational training, and Appendix C provides a review of studies evaluating vocational training in the United States and abroad.

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Educational Evaluation and Decision Making. Daniel L. Stufflebeam, Walter J. Foley, William J. Gephart, Egon G. Guba, Robert L. Hammond, Howard O. Merriman, and Malcolm M. Provus. Itasca, Illinois: F. E. Peacock Publishers, Inc., 1971, 368 pp.

Used as an education evaluation text, this book has four stated purposes:

- To expose five evaluation problem areas--definition, decision-making, values and criteria, administrative levels, and the research model
- To identify and assess existing formulations that may be useful in conceptualizing solutions to the five problems
- To use the existing information to synthesize a new definition and methodology of evaluation
- To provide guidelines for implementing the proposed new approach to evaluation

The authors note that an effective and efficient evaluation requires a team effort: "The book is directed at those who commission the development of evaluation units, operate the units, use the information produced by the units, comprise evaluation teams, produce methods and materials for use in evaluation units, and train staff for work in evaluation units."

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Evaluating Occupational Education and Training Programs. Tim L. Wentling and Tom E. Lawson. Boston: Allyn and Bacon, Inc., 1975, 355 pp. (ED 109 449)

Designed to serve as a program evaluation handbook and guide, this book addresses teachers and administrators of occupational education in public elementary, secondary, and postsecondary programs as well as administrators and personnel connected with private instructional programs in schools and in industrial programs. The methodology described, however, is also adaptable to the evaluation of academic programs.

The introductory chapter summarizes the history of evaluation and presents two current, widely accepted definitions of evaluation--the decision-oriented definition (Phi Delta Kappa Committee on Evaluation) and the evaluator judgment definition (Worthen and Sanders).

Chapters 3 through 8 provide specific evaluation procedures for student assessment, student follow-up, consultative team evaluation, personnel evaluation, and cost analysis.

Individual chapters provide specific evaluation activities and example forms and instruments to aid in the evaluation process. The concluding chapter presents a general overview of how changes occur within education programs and how evaluation can be used to effect change and improve programs.

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"Evaluating Vocational Education and Technical Programs," Jerome Moss, Jr. and Ernst W. Stromsdorfer. Chapter 9 in Vocational Education Today and Tomorrow. Edited by Gerald G. Somers and Kenneth Little. Madison: University of Wisconsin, Center for Studies in Vocational and Technical Education, 1971, 221 pp.

This chapter treats program evaluation as a process to determine the relative efficiency of a set of activities designed to attain desired outcomes. The process requires (1) that comparison between the outcomes of two or more sets of activities be made and (2) that differences found be attributable to variations in the program activities. The model, then, for evaluating the efficiency and effectiveness of vocational education should examine alternative processes which may produce the desired outputs; and it should determine which process is the more efficient. Evaluation characterized by this model is quantitative, directed at program purposes, and links costs with benefits.

The problems associated with specification and measurement of input variables--student inputs, educational process inputs, and socioeconomic influences--are discussed, as are the problems associated with specification and measurement of program output and estimation of net effects of programs.

The remainder of the chapter describes and reviews several kinds of non-economic studies of vocational education outcomes and economic studies of vocational education and manpower training programs.

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Evaluating Vocational Education: Policies and Plans for the 1970s. With an Annotated Bibliography. Leonard A. Lecht. New York: Praeger Publishers, 1974, 194 pp. (ED 123 395)

This book, concerned with policy issues and related analytical problems involved in the evaluation of vocational education, is based on a study undertaken by the National Planning Association for the U.S. Office of Education and the National Advisory Council of Vocational Education. The author points out that between 1965 and 1970 the federal share of the total expenditure for vocational education decreased from 29 per cent to 16 per cent and speculates on the future role of the federal government in determining priorities if support continues to decrease.

Reasons for data gaps and inconsistencies in vocational education enrollment and student socioeconomic background information as reported in several national studies are discussed in Chapter 2. Subsequent chapters address the need for relating projected manpower needs to accurate data of enrollment in vocational programs in order to provide better planning information for both students and program administrators. Advantages and disadvantages of substituting revenue sharing for the grants system in distributing federal aid to vocational education are discussed in Chapter 5.

The final chapter is based on Ernst W. Stromdorfer's report, "The Methodology of Major Studies with Illustrations." Stromsdorfer points out that since many evaluative studies of vocational education do not employ accurate models for determining marginal costs, they fail to recognize distinctions between marginal and average costs and benefits. The model is quantitative and directly related to the specific purpose served by the program being evaluated.

- It examines the nature of the output process of competing programs.
- It determines which program and program output process is most efficient.

The model requires the following steps: (1) Specification of program objectives; (2) Specification of processes or activities and the production function or process; (3) Specification of cost function or cost relationship based upon the production function for each activity; (4) Specification of benefit functions based upon a set of indexes designed to measure program output; and (5) Comparisons of costs and benefits.

According to Stromsdorfer, the production function or process is a critical concept in any program evaluation since it is through understanding how program inputs affect outputs that rational changes in program structure can be made. The author of this chapter, Michael Carbine, contends that vocational education, particularly at the secondary level, should not be concerned merely with efficiency since the question of equity may thereby be ignored. Data drawn from the National Longitudinal Survey and studies by Teh-wei Hu, Fernbach and Somers, Eninger (Metro I and II), and others are used to discuss such issues as vocational education and earnings and employment, socialization, further education, remaining in school, and post-secondary and secondary programs.

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Evaluation of Occupational Education Programs. Jerome Moss, Jr. Minneapolis: University of Minnesota, Research Coordination Unit in Occupational Education, September 1968, 22 pp.

To provide a conceptual framework for evaluation of vocational education programs, the author discusses these eight dimensions of program evaluation: (1) The importance of program evaluation; (2) Some causes of past inactivity in evaluation; (3) A definition of program evaluation; (4) Program outcomes (or evaluative criteria); (5) Program characteristics; (6) Two roles of program evaluation; (7) Evaluation as a part of the educational change process; and (8) Some research approaches to evaluation. Research approaches discussed include formative evaluations, follow-ups, experiments, interrupted time series, and analysis of regression.

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Evaluation of Vocational Technical Education. Phase II.
New Educational Directions, Inc. Indianapolis: The
Indiana State Board of Vocational Technical Education,
May 1976, 17 pp.

The vocational-technical education evaluation model described in this document is designed for use at the individual program level and consists of 13 main components as follows:

(1) Descriptive Information

(2) Demonstration of Need

(3) Student Recruitment and Selection

(4) Curriculum

(5) Guidance and Placement

(6) Facilities

(7) Program Staffing and Administration

(8) Community Involvement

(9) Youth Organizations

(10) Cooperative Programs

(11) Program's Effects on Students

(12) Holding Power and Popularity

(13) Satisfaction of Various Audiences with Program

Each component, broken down into subcomponents, consists of a general rationale for evaluating that aspect of the vocational program, suggestions for approaches to investigation, and recommendations for research and development.

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"Evaluation Research in Vocational Education." J. Robert Warmbrod. Beacon, Vol. 6, No. 1, January 1977, 6 pp.

In his address before the American Vocational Education Research Association, reprinted in Beacon, the Association's newsletter, Warmbrod proposes a comprehensive analysis and critique of recent state, regional, and national studies that "purport to investigate the effectiveness of vocational education in the secondary and postsecondary schools." Such a review should address the following questions:

- What are the specific strengths and weaknesses of the design?
- To what extent do the instruments and procedures used minimize measurement error?
- Are the findings valid?
- To what populations and programs can the valid findings be generalized?

Whether vocational education is viewed as a function of the total school program or as only a segment of the school program must be considered in designing and conducting evaluation studies. Evaluation of a school's occupational education function is considered to be the description and explanation of a series of outcome variables in terms of a variety of input variables such as initial abilities and motives of students, family and community characteristics and values, school resources and policies, peer groups, the nature of the instructional program, and experiences of students in school and out of school.

When the outcome variables relate to labor market entry and performance, factors over which the school has little control (economic conditions, employment practices, mobility and migration of students) need to be considered. The appropriate research methodology is described as a "naturalistic correlational method with regression analysis and other multivariate techniques the major statistical strategies for attempting to partial out the influence of the various inputs on the criterion measures."

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A Model for Evaluating Programs in Vocational Education for the Handicapped. Final Report. Gerald Bekker and James E. Cristiansen. College Station: College of Education, Texas A&M University, August 1975, 179 pp. (ED 115 984)

The stated purpose of this study is to develop an evaluation model for use in determining the effectiveness of pilot programs in vocational education for the handicapped and to field test the developed model by conducting evaluations of 16 pilot programs in schools and state hospitals in Texas. A four-member evaluation team consisting of individuals knowledgeable in vocational education or in the field of special education for the mentally retarded collected data by on-campus visits.

The model was found to provide useful decision-making information for comparisons on either a "program by program" or "institution by institution" basis; however, goal concepts used in the model were found to be more applicable to vocational education programs in public secondary and post-secondary institutions than to the pilot programs in state schools and hospitals. The model development process, test procedures, and findings are detailed in the report; and sample questionnaires used in the study and related computer program information are included.

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Practices in Program Evaluation: A Survey and Some Case Studies. Samuel Ball and Scarvia B. Anderson. Princeton: Educational Testing Service, October 1975, 152 pp. (ED 115 680)

This report is the second of a three-phase series to study and improve theory and practice of training/education program evaluation. Phase two consists of two related research activities directed at collecting data about actual practices of program evaluation in various settings: the surveying of 200 adult education/training programs which had undergone some kind of program evaluation, and case studies of 14 programs (including site visits) judged to have undergone the best evaluations.

The 200 program evaluations were divided equally among four types of sponsoring agencies--Department of Defense; other federal government departments and agencies; state and local governments and agencies, including junior/community colleges; and private business and industrial organizations. Approximately 70 percent of the programs had been formally evaluated, usually for the purpose of program improvement rather than to assess program impact. The formal evaluation typically had consisted of questionnaires and interviews of students and teachers; and these evaluations usually had been called for, funded, and carried out by internal rather than external agencies. Written evaluation reports were rare, and written evaluation reports available to outsiders were even more rare.

The first phase of this three-phase series resulted in the publication of the book, Encyclopedia of Educational Evaluation, which presents in non-technical language the major concepts and practices in education evaluation. The third phase resulted in Professional Issues in the Evaluation of Education/Training Programs, Ball and Anderson, October 1975 (ED 115 681). Characterized as a "codification of evaluation principles" and a framework for appropriate evaluation practices, this publication provides evaluators and those who commission evaluations with checklists for a systematic approach to evaluation. Checklists are included for common purposes of evaluation and appropriate methods of investigating each, sources of evidence, types of administration relationships, audiences for dissemination of results, value orientations of evaluators, competencies needed by evaluators, and ethical responsibilities of evaluators and related groups.

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A System for Statewide Evaluation of Vocational Education. Final Report. Harold Starr and Richard A. Dieffenderfer. Columbus: The Center for Vocational and Technical Education, The Ohio State University, May 1972, 178 pp. (ED 066 561)

This publication describes an evaluation system designed to assist state divisions of vocational education in cooperation with local school systems, in assessing the effectiveness of vocational education programs. System components can be modified by vocational agencies in the states to meet special needs in collecting data about local program characteristics, student status and characteristics, and student follow-up in terms of outcome measures. Charts, forms, and tables illustrate the system's potential for collecting data. Also included is an envelope of evaluation instruments designed for use in the state evaluation.

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Category 4: EMPIRICAL STUDIES FOCUSING ON VOCATIONAL EDUCATION TOPICS OTHER THAN OUTCOMES

LIST OF TITLES[1]

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Education for a Changing World of Work: Report of the Panel of Consultants on Vocational Education. U.S. Department of Health, Education, and Welfare, Office of Education, 1963, reprinted 1964.	219
Education for a Changing World of Work. Appendix 1. Technical Training in the United States. Lynn A. Emerson. U.S. Department of Health Education, and Welfare, Office of Education, 1963.	220
Education for a Changing World of Work. Appendix 2. Manpower Farming and Related Occupations. C. E. Bishop and George S. Tolley. U.S. Department of Health, Education, and Welfare, Office of Education, 1963.	221
Expectations and Satisfactions of Parents and Students with Vocational and Technical Education. Statewide Evaluation of Vocational-Technical Education in Florida. Volume 4. Gordon S. Purrington. Florida State University, 1972.	221
Notes and Working Papers Concerning the Administration of Programs Authorized Under Vocational Education Act of 1963. Public Law 88-210, as Amended. U.S. Congress, Senate, Committee on Labor and Public Welfare, 1968.	222
Training America's Labor Force: Potential, Progress, and Problems of Vocational Education. Report to the Congress. U. S. General Accounting Office, 1972.	223
What Is the Role of Federal Assistance for Vocational Education? Report to the Congress. U.S. General Accounting Office, 1974.	224

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[1] Complete bibliographic citations for these titles, along with supplementary information, are provided with annotations on the pages that follow.

Education for a Changing World of Work: Report of the Panel of Consultants in Vocational Education (CE-80021). U.S. Department of Health, Education, and Welfare, Office of Education. Washington, D.C.: U.S. Government Printing Office, 1963, Reprinted 1964, 196 pp. (ED 019 500)

In 1961 a Panel of Consultants was appointed by the Secretary of Health, Education, and Welfare and charged with the responsibility of reviewing and evaluating the national vocational education acts in order to make recommendations for improving and redirecting training for industry, agriculture, and other occupational areas. The Panel consulted various specialists, commissioned studies, and convened a number of special conferences on the educational aspects of national manpower resources and requirements, the results of which are recorded in this publication.

Federally reimbursed vocational training in the public schools in 1961 were found to consist of courses in agriculture, trade and industry, home economics, distribution, practical nursing, fishery, and technical education. Support service areas included occupational information, vocational guidance, supervision and teacher training, research, youth organizations, instructional materials and administration. In studying the training programs and services in vocational education, the Panel found that use of federal funds for occupational information and vocational guidance was extremely limited. Research had been sporadic and uncoordinated and directed chiefly toward program operation. The federal level of administration in vocational education had changed in 45 years from direct responsibility to the President of the United States to the fourth level of administration in the Department of Health, Education, and Welfare. Additionally, a need was felt for instructional materials in vocational education programs.

In reporting limitations, the Panel pointed out that vocational education was not sufficiently responsive to labor force demands. It was not available in many schools; training choice was limited; placement services to graduates were not adequate; and standardized reporting procedures were needed. The Panel also pointed out that the contributions of vocational education in international programs were small in comparison to probable need, and vocational educators were not generally involved in the initial planning for economic aid to other nations.

The Panel's recommendations were grouped under three "need for change" categories:

- Vocational education must be made available to all people who have the need, the desire, and the ability to benefit from such instruction.
- Education for occupational competency should be carefully correlated with the possibility of employment.
- An evaluation committee of competent authorities should report the strengths, limitations, and weaknesses of the vocational training program.

The Panel further recommended that since occupational categories are no longer isolated from each other, funding and administration restrictions should not be permitted to prevent expansion of course content, combination of courses, or elimination of courses when such changes may provide a better training program.

The Panel concluded that vocational education and general education are complementary and equally important to individual occupational competence and that expanded vocational education, apprenticeship, and technical training are especially needed to prepare both new workers and the unemployed to fill job openings for skilled or specialized workers. Stimulus and support of vocational and technical education were viewed by the Panel as part of the federal government's responsibility in equalizing educational opportunities and in providing the skilled manpower needed by the nation's economy.

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Education for a Changing World of Work. Appendix 1: Technical Training in the United States. Lynn A. Emerson. Washington, D.C.: U.S. Department of Health, Education, and Welfare, Office of Education, 1963, 170 pp. (ED 019 502)

Appendix 1 to the report of the Panel of Consultants deals with the status of technical education in the United States in 1961. The technician is described as a worker giving technical support to and performing many of the tasks of the engineer. The Appendix lists various technical occupations and tasks performed by technicians and describes programs used for providing trained technicians to meet the needs of industry. Specific recommendations are made related to the type of institution in which technical training is offered. General recommendations for legislation in the field of technical education are included.

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Education for a Changing World of Work. Appendix 2: Manpower Farming and Related Occupations. C. E. Bishop and G. S. Tolley. Washington, D.C.: U.S. Department of Health, Education, and Welfare, Office of Education, 1963, 51 pp. (ED 019 501)

Appendix 2 to the report of the Panel of Consultants discusses the effects of economic progress on the structure of the agricultural industry in 1961, the amount and quality of human resources employed in farming and related occupations, and educational implications of these changes. Decrease in number of farms and increase in agricultural technology, resulting in lower demand for farm labor, led to projections of continued reduction in farm population into the 1980s. Trends with implication for agricultural education include the need for more highly trained farmers with managerial ability and agricultural curricula that reflect technological and occupational changes.

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Expectations and Satisfactions of Parents and Students with Vocational-Technical Education. Statewide Evaluation of Vocational-Technical Education in Florida. Volume 4. Gordon S. Purrington. Tallahassee: Florida State University, 1972, 67 pp. (ED 074 225)

This study, one of a series of studies conducted in the "Statewide Evaluation of Vocational-Technical Education in Florida," examines the expectations and satisfactions of students and their parents with secondary and post-secondary levels of education in traditional public schools, vocational centers, and in a community college.

An analysis of data gathered from students of ten participating schools and the students' parents revealed that both students of vocational-technical centers and their parents supported these schools and were more satisfied with the educational experiences offered there than were students of the traditional high school and their parents. General support from all groups for vocational programs, particularly in the area of vocational guidance, led to the conclusion that greater emphasis should be placed on vocational guidance in the traditional high school.

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Notes and Working Papers Concerning the Administration of Programs Authorized Under Vocational Education Act of 1963, Public Law 88-210, as Amended. U.S. Congress, Senate, Committee on Labor and Public Welfare, Subcommittee on Education. Washington, D.C.: U.S. Government Printing Office, March 1968, 423 pp. (ED 021 151)

Under the provisions of the Vocational Education Act of 1963, the Advisory Council on Vocational Education was directed to review the administration and status of vocational education programs and to make recommendations for their improvement. The report Vocational Education: The Bridge Between Man and His Work is divided into three parts (all contained in Notes and Working Papers Concerning the Administration of Programs). Part 1 is a summary of the general report contained in Part 2, and Part 3 includes recommendations adopted from the general report. The theme throughout the final section is "Never before has attention to the individual as a person been so imperative."

There were 26 specific recommendations for legislation, including the following:

- Combine all federal vocational education acts administered by the Office of Education
- Establish a Department of Education and Manpower Development at cabinet level
- Provide funds for the Commissioner of Education to make grants to or contracts with state boards and other public or non-profit private agencies

for planning, development, and operation of exemplary and innovative programs for occupational preparation

- Provide funds and require the Office of Education to be responsible for collecting data and preparing an annual descriptive and analytical report on vocational education to be submitted to the President and Congress
- Provide that each state conduct a periodic statewide review and evaluation of its vocational education program
- Include within the definition of vocational education "pre-vocational" education and "employability skills"
- Expand the definition of vocational education in the act to include the responsibility of education for initial job placement and follow-up
- Establish two to four centers for curriculum development in vocational education.

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Training America's Labor Force: Potential, Progress, and Problems of Vocational Education. Report to the Congress. U.S. General Accounting Office, Washington, D.C., 1972, 47 pp. (ED 047 208)

This document contains the findings, conclusions, and recommendations resulting from the investigation in 1972 by the General Accounting Office of high school and community college vocational education programs in California, Michigan, Ohio, and Pennsylvania. These four states, having received 22 per cent of the vocational education funds alloted to the states in 1972, were reviewed to determine whether or not legislative objectives were being met and to identify major problems. Topic headings under which information is reported include "Vocational Education Not Reaching All Who Need It," "Funds Targeted for the Disadvantaged Miss the Mark," and "Management Information Incomplete and Inaccurate."

Among the recommendations made to HEW are the following:

- HEW should coordinate federal and state efforts to define the information needed to evaluate program results adequately.
- Research should be undertaken regarding the exact nature and extent of the funding and image problems attached to vocational education in order to determine what action is required to achieve more fully the objectives of the Vocational Education Act.
- Regional offices should closely monitor the use of federal funds for special programs and services for the disadvantaged to ensure that funds are being used properly.

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What Is the Role of Federal Assistance for Vocational Education? Report to the Congress. U.S. General Accounting Office, Washington, D.C., 1974, 123 pp. (ED 105 132)

To review implementation of vocational education programs in 1973 at national, regional, state, and local levels, the General Accounting Office undertook this in-depth study in seven states--California, Kentucky, Minnesota, Ohio, Pennsylvania, Texas, and Washington. The study focused on these questions: (1) What role does the federal dollar play? (2) How is vocational education planned? (3) How are federal vocational funds distributed? (4) How are training resources used? (5) Is training related to employment?

Among the recommendations submitted to the Secretary of the Department of Health, Education, and Welfare are the following:

- HEW should develop with the states an improved approach to planning which will better meet state needs and provide necessary information to monitor and evaluate federal program expenditures.

- HEW should expand its effort to enforce the requirement that all local and state education agencies, in planning vocational programs, identify the needs of students and those of public and private business, industry, and labor; these needs should be considered the primary basis for decision making in the provision of vocational services supported by the Vocational Education Act.

- HEW should increase its efforts in the development of vocational information systems that will provide comparable data and should continuously review utilization of that data to improve vocational education.

- HEW should analyze actual state practices in distribution of federal funds to determine consistency with the law's criteria.

- HEW should assist states in identifying and implementing strategies in order to eliminate barriers which inhibit improvement or expansion of vocational programs and which restrict persons from fully participating.

- HEW should implement provisions of Title IX of the Education Amendments of 1972 to eliminate sex discrimination in vocational education, particularly by encouraging the use of techniques that have proved effective in recruiting members of one sex to occupations traditionally considered the prerogative of the other sex.

The following recommendations were made to the Congress for consideration in deliberations on the Vocational Education Act:

- Require federal funds to be directed to programs for which existing or anticipated job opportunities can be demonstrated

- Require work experience to be an integral part of the basic grant programs, to the extent that it is feasible

- Require schools to take responsibility for job-placement assistance and follow-up

It was further recommended that Congress (1) amend provisions of the Higher Education Act of 1965 so that students without a high school diploma or equivalent would be able to take advantage of federal grant and loan programs for post-secondary schools and (2) consider amending the Vocational Education Act to remove restrictions limiting vocational education opportunities to those in or above ninth grade since not all handicapped youth are able to reach the secondary level.

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Category 5: MISCELLANEOUS

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Career Intern Program: Final Report. Volume 1: An Experiment in Career Education That Worked. Michael Langsdorf and Richard A. Gibboney. NIE Papers in Education and Work: No. 7. Washington, D.C.: U.S. Department of Health, Education, and Welfare, National Institute of Education, May 1977, 217 pp. (ED 142 795)

The Career Intern Program (CIP) was initiated by the Opportunities Industrialization Centers of America, Inc., with support for development and evaluation from the U.S. Office of Education and the National Institute of Education. The Career Intern Program is described as combining basic and career education for high school youth who are not succeeding in regular school. In addition to discussing the education problems of the program, the report deals with the effort to link formative and summary evaluation to program development and utilization.

Technical aspects of the evaluation design with a description of the instruments used and a discussion of the data analysis procedures are contained in a separate volume, cited below.

Career Intern Program: Final Report. Volume II. Technical Appendices. Richard A. Gibboney Associates, Inc. NIE Papers in Education and Work: No. 7. Washington, D.C.: U.S. Department of Health, Education, and Welfare, National Institute of Education, May 1977, 231 pp. (ED 145 231)

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Education Amendments of 1976, Public Law 94-482. U.S. Congress. Washington, D.C.: U.S. Government Printing Office, October 12, 1976.

The stated purpose of Title II (Vocational Education) of the Education Amendments of 1976 is as follows: (1) to extend, improve, and, where necessary, maintain existing programs of vocational education; (2) to develop new programs of vocational education; (3) to develop and carry out programs of vocational education within each state that will overcome sex discrimination and sex stereotyping in vocational education programs; and (4) to provide part-time employment for youths who need the earnings in order to continue their vocational training on a full-time basis.

Among the salient features of the Amendments are the following:

- Each state must assign full-time personnel to assist in reducing sex discrimination and sex stereotyping in vocational education programs and activities. Each state is to expend $50,000 from the basic grant for this purpose.

- Each state shall increase its advisory council from 12 to at least 20 members appropriately representing special groups.

- Each state must maintain on file with the Commissioner of Education a general application containing twelve assurances covering a broad range of administrative and fiscal matters. The application includes the assurance that the state will give priority in distributing funds to economically depressed areas and areas with high unemployment, to programs which are new to the area, and to local education agencies with a high concentration of low-income populations.

- At least 10 per cent of the state's allotment is to be used to pay up to 50 per cent of the costs of special programs, services, and activities for the handicapped; and at least 20 per cent of the state's allotment is to be used to pay up to 50 per cent of the costs of special programs, services, and activities for the disadvantaged, for persons with limited English-speaking ability, and for stipends for students with acute economic needs which cannot be met under other programs.

- In program evaluation, employer feedback on the training preparedness of individuals shall be considered as well as placement data.

- The state must use 20 per cent of its allotment for program improvement and supportive services such as research, innovative programs, and curriculum development programs.

- The state must use funds for programs in consumer and homemaking education. The federal share is 50 per cent except in economically depressed areas where it shall be 90 per cent.

- There must be a greater coordinated effort involving secondary, post-secondary, adult education, area vocational centers, and CETA programs.

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Education Amendments of 1976 and Their Implications for Vocational Education. Information Series No. 122. William W. Stevenson. Columbus: The Center for Vocational Education, The Ohio State University, 1977, 21 pp. (ED 149 191)

This information analysis paper, examining the Education Amendments of 1976, focuses on the areas of special legislative emphasis that are expected to bring about the greatest change in vocational education. Topics receiving special attention include coordination with CETA; compliance with Public Law 94-142, the Education for All Handicapped Children Act; planning, information systems, and evaluations; elimination of sex bias and sex stereotyping; and special groups--disadvantaged, handicapped, and English deficient.

The author suggests that the legislation is an indication that "Congress is no longer satisfied with a vocational education program that accurately reflects the labor market with all its exclusions, restrictions, and traditions" and speculates on the potential for changing the work place by changing the training programs which prepare students for work.

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Education and Job Satisfaction: A Questionable Payoff. Robert P. Quinn and Martha S. Baldi de Mandilovitch. NIE Papers in Education and Work: No. 5. Washington, D.C.: U.S. Department of Health, Education, and Welfare, The National Institute of Education, March 1977, 69 pp. (ED 129 702)

This report examines (1) the assumption that the better the education, the greater the chances of securing a desirable, satisfying job and (2) the social and psychological processes that may link education and job satisfaction. Sources of information used for the study include sixteen previously published research reports bearing either directly or indirectly on the relationship between education and job satisfaction and secondary analyses of nine national surveys designed for purposes other than understanding the relationship between education and job satisfaction.

Five of the sixteen studies found a positive association between education and job satisfaction, three found a negative association, and eight reported the relationship to be either non-existent or equivocal. Analyses of the nine national surveys found no increment in job satisfaction with succeeding years of education. However, while no relationship was found between education level and job satisfaction among workers who had not gone to college, those who had obtained college degrees were consistently more satisfied with their jobs than were employees without degrees. All but one of the surveys identified "credentials effect," evidence that there was no payoff in job satisfaction from having college training unless one also received a college degree. Level of education was significantly and positively related to overall quality of employment, and the greatest increment in quality of employment occurred at those points where educational credentials were conferred.

The report concludes with several recommendations for further research and for policy changes on the part of employers and educators. Among the recommendations for policy changes are the following:

- Employers and educators should be aware of the occupational needs of the over-educated.
- The educational requirements established for jobs should be re-examined.
- Job design, where possible, should take into account the increasing education level of the labor force.

- Educators should place greater emphasis on general skills, anticipating the many job changes in life.
- Training for specific jobs should be reserved until it becomes necessary for the worker to receive such training.
- Educators should not justify "every unpleasant thing in school" as essential for securing a good job.

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Equality of Educational Opportunity. James S. Coleman, Ernest W. Campbell, Carol J. Hobson, James McPartland, Alexander M. Mood, Frederic D. Weinfeld, and Robert L. York. Washington, D.C.: National Center for Educational Statistics, 1966, 746 pp. (ED 012 275)

This volume, the product of an extensive survey requested in the Civil Rights Act of 1964, reports on educational opportunities in public schools for minority groups--Blacks American Indians, Oriental Americans, Puerto Ricans, and Mexican Americans. The survey addresses four major questions:

(1) To what extent are the racial and ethnic groups segregated from one another in the public schools?

(2) Do schools offer equal educational opportunities according to criteria regarded as good indicators of educational quality?

(3) How much has the student learned as measured by performance on standardized tests?

(4) What is the relationship, if any, between students' achievement and the kinds of schools attended?

James Coleman of Johns Hopkins University held the major responsibility for the design, administration, and analysis of the survey, which was carried out by the National Center for Educational Statistics.

Initial findings from analysis of the data indicated that Black students and teachers were frequently segregated from their white counterparts. Additionally, with integration, the average minority student's test scores improved. However, the authors, acknowledging that the various groups of students might have been from different backgrounds, noted that this possibility had not been taken into account.

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Equality of Educational Opportunity, Reconsidered. James S. Coleman. Baltimore: Johns Hopkins University, 1967, 19 pp. (ED 015 893)

In examining the concept of equal educational opportunity, Coleman points out the need to consider intensity of the effects of school resources as well as the equality of the distribution of these resources. Focusing attention on equality of distribution of education resources, he contends, results in inattention to an important area of inequality, that of opportunity--not from the school system but from outside and "not overcome by the school system."

He concludes that if a child's opportunity is to be separate from accident of birth into a given family, society must move toward providing an equality of opportunity based on the distribution of educational resources and the intensity of effect of those resources.

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Evaluation of the Cumulative Effects of Research for Better Schools Career Education, 1974-1976. Thomas W. Biester. Philadelphia, Penn.: Career Education Program, RBS, August 31, 1976. (Funded by P.L. 8910, Title IV and by NIE Contract #NE-C-004-0011.) (ED 138 822)

This report examines the effects of participation in the Research for Better Schools (RBS) Career Education Program. The sample for the study was drawn from 10th, 11th, and 12th grade students enrolled in 1974 in a large Philadelphia high school containing the Academy for Career Education. Students were randomly assigned to experimental and control groups. The experimental group participated in the Career Education Program while the control group continued in a regular high school curriculum. Instruments used to collect information on career skills, life or self skills, basic academic skills, and demographic characteristics included specially designed questionnaires, as well as previously developed inventories and scales and the standardized "Comprehensive Tests of Basic Skills."

Compared with the control group, the experimental group demonstrated significant growth in career knowledge over the course of two years and showed significant growth on all basic skills measured.

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Factors Related to the Coordination and Effectiveness of Occupational Education Programs. Final Report. John T. Pelham. Jackson: Mississippi State University, Social Science Research Center, August 10, 1972, 196 pp. (ED 068 649)

The primary purpose of this study was to develop and test a model for the study of job creation, job training, and job placement in the community. Personal interviews with 84 community leaders, agency representatives, and major employers in four communities were conducted to gather manpower development process information. Additional data were gathered by participant observation, content analyses of documents, and from the census and training agency records.

Recommendations resulting from the study include the following:

- To avoid duplication of effort, job training agencies must have mutual awareness of service offerings.
- Members of the "power structure" must be aware of job training programs in the local community.

- Representation on advisory councils by community leaders and major employers should be encouraged.
- Formal evaluation of vocational-technical training programs should include information from local employers.
- Advisory and craft committees should be better utilized.
- Training programs should be designed for open entry/open exit.
- Administrators of vocational education should be encouraged to finance more inter-disciplinary research, symposia, and new learning experiences.

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Hearings Before the Subcommittee on Elementary, Secondary, and Vocational Education of the Committee on Education and Labor. Volume 1. 94th Congress, House, First Session on H.R. 19 and Related Bills to Amend the Vocational Education Act of 1963. Washington, D.C.: U.S. Government Printing Office, February and March 1975.

This volume includes prepared statements, documents, and testimony from representatives of various states, special interest groups, and associations before the House subcommittee chaired by Representative Carl D. Perkins. The General Accounting Office (GAO) report, What Is the Role of Federal Assistance for Vocational Education? is reprinted in this volume, along with responses from the U.S. Department of Health, Education, and Welfare and the seven states covered in the GAO study.

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Hearings Before the Subcommittee on Elementary, Secondary, and Vocational Education of the Committee on Education and Labor. Volume 2. 94th Congress, House, First Session on H.R. 19 and Related Bills to Amend the Vocational Education Act of 1963. Washington, D.C.: U.S. Government Printing Office; March, April, May, and June 1975.

This second volume of prepared statements, documents, and testimony before the House subcommittee of the hearings to amend the Vocational Education Act of 1963 contains among its reprints documents submitted by Roman Pucinski, Rupert N. Evans, William G. Conroy, Edwin L. Herr, Norman C. Gysbers, and Terrel H. Bell.

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How Effective Is Schooling? A critical Review and Synthesis of Research Findings. Harvey A. Averch, Stephen J. Carroll, Theodore S. Donaldson, Herbert J. Klesling, and John Pincus. Santa Monica, California: Rand Corporation, March 1972, 222 pp.

This report was prepared for the President's Commission on School Finance as part of its study of alternative funding arrangements for primary and secondary education. The objective was to assess the current state of knowledge regarding the determinants of educational effectiveness. Five basic approaches used in educational research were identified--input/output, process, organizational, evaluation, and experiential. The authors concluded from their review of research studies that "research has found nothing that consistently and unambiguously makes a difference in student outcomes." Six major issues toward which future research could profitably be directed were identified. A 15-page bibliography is included.

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Identifying Handicapped Students and Their Vocational Needs for 1977-1982. Marion E. Franken. Madison: Wisconsin Vocational Studies Center, University of Wisconsin, July 1977, 65 pp.

This report summarizes research conducted in Wisconsin during the fiscal year 1977. Included in the report is information concerning research objectives, methodology, instrumentation, and sampling design. The study, conducted to identify the cognitive, psychomotor, and affective characteristics of handicapped students 14-21 years of age in Wisconsin, surveyed a 20 per cent sample of the teachers of these students.

Data gathered indicated that the majority of the students were English-speaking Caucasian young men. The average intelligence quotient was below 80, and the students were generally below level in grade placement and achievement. Their career goals were in the areas of agriculture, manufacturing, consumer and homemaking education, and construction. The report included the following recommendations:

- Decision-making administrators and planners should prepare educators for the kinds of students who will enter vocational programs at the secondary or post-secondary level.
- Strategies need to be planned to assist the handicapped in the community and in the school.
- Pre-service and in-service course experiences should be provided for vocational educators to learn special education techniques, and special education personnel should be provided to assist vocational educators.
- A determination of how these students have been affected should be made by recording their reason for leaving a program of instruction.

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Manpower Economic Education and the Transition from School to Work. Robert L. Darcy, Richard V. Kauffman, and Edward P. Milker. Fort Collins: Colorado State University, Department of Economics, Center for Economic Education, February 1974, 217 pp. (ED 091 581)

Using longitudinal data gathered over a five-year period, a sample of 242 was drawn from 645 young female and male students for study to determine the impact of an experimental manpower economics course on world-of-work understanding, attitudes, and education-related and employment-related behavior. While the eighth-grade course (fall semester 1967-68) had significant short-run impact on understandings and attitudes of students who received instruction compared with those of control students matched for mental ability, few long-run differences were observed between the groups during high school and as of the February 1973 survey week eight months following graduation.

Wage rates and weekly pay were not associated with scores on a test of world-of-work understanding or with IQ, academic rank in high school, or family income but were associated with labor union membership and sex. Both the experimental and control groups made a smooth transition from school to work or to post-secondary educational programs; and labor force participation, wages, and work satisfaction were relatively high and unemployment rates low. On the other hand, major differences were observed between graduates and dropouts.

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Philosophy for Quality Vocational Education Programs. Fourth Yearbook of the American Vocational Association. Melvin L. Barlow, ed. Washington, D.C.: The American Vocational Association, Inc., 1974, 283 pp. (ED 102 425)

This American Vocational Association Yearbook deals with the relationship between the philosophical concepts and practical demands of program organization and operation in vocational education. Experienced educators present their differing philosophic orientations on a variety of topics.

Melvin L. Barlow views the role of vocational education in an industrial society from a historical perspective and presents the yearbook theme. Robert Miller examines the place and function of vocational education in the total educational system. Garth L. Mangum presents the economics of vocational education in a social context for cost/benefit analysis, and Gordon I. Swanson focuses on the development of vocational education policy. Instructional principles, status of career guidance in America, learner characteristics, job placement and follow-up, and the place of community involvement in education are other topics addressed.

In the epilogue Barlow reviews relevant issues and stresses the need for a recommitment by all vocational educators to the basic principles and philosophy of vocational education.

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RBS Career Education, 1975-1976: Within-Model Evaluation Report. Thomas W. Biester. Philadelphia: Research for Better Schools, Inc., August 31, 1976, 50 pp. (ED 138 820)

This report describes the implementation of Research for Better Schools (RBS) Career Education at three sites during the 1975-76 school year. The program for secondary-level students uses three instructional components--Career Development, Career Guidance, and Basic Skills--to achieve program goals of providing students with cognitive skills, career experiences, and personal perspective to aid them in selection and pursuit of adult life goals.

Modeled after the RBS Career Education program in Philadelphia's Academy for Career Education in operation for four years, programs were initiated in Washington, Pennsylvania; Washington Township, New Jersey; and Wilmington, Delaware. Common evaluation activities conducted at all RBS Career Education sites during the year included monitoring program operations and assessing participant opinions. In general, responses indicated that students, parents, and community participants were in factor of the program and recommended its continuation.

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Rural Oriented Research and Development Projects: A Review and Synthesis. R&D Monograph No. 50. U.S. Department of Labor, Employment and Training Administration. Washington, D.C.: U.S. Department of Labor, 1977, 134 pp.

Based on a review of 71 documents, this report describes the results of research on employment and training problems and on programs in rural areas between 1963 and 1975. Major topics covered by this review, conducted by the Office of Research and Development of the Employment and Training Administration, include the various definitions of "rural" implied in the literature, factors affecting and techniques used in forecasting supply and demand for labor in rural areas, and findings and results of research and development projects in rural areas.

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Sex Fairness in Career Education. Information Series No. 109. Marla Peterson and Louise Vetter. Columbus: The Center for Vocational Education, The Ohio State University, 1977, 43 pp. (ED 149 179)

The first section of this paper addresses the question, "Why should we be concerned with sex fairness in career education?" Subsequent sections focus on the current status of women in employment and leadership positions in career education.

Suggestions for making career education "sex fair" include the following:

- Programs federally contracted should be conducted to teach women how to become aware of contract and grant announcements, how to prepare proposals, and how to manage contracts and grants.
- Criteria for selecting state leadership personnel should be widely disseminated.
- Leaders in career education should take the initiative to nominate and promote outstanding women to serve on the Advisory Council.

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Sex Fairness in Vocational Education. Information Series No. 120. John R. Schenck. Columbus: The Center for Vocational Education, The Ohio State University, 1977, 54 pp. (ED 149 189)

This report, a review and synthesis of significant literature on sex bias and sex-role stereotyping in vocational education, discusses the impact that stereotyping and bias have on careers in vocational education; the courses that have promoted sex-role stereotyping--socialization, instructional materials, vocational interest inventories, and the world of employment; and the forces that promote eradication of sex unfairness in vocational education.

To reduce sex unfairness in vocational education, the author recommends the following policies:

- Enforcement of appropriate laws
- Administrative support from the vocational education hierarchy in each state
- Affirmative action in promoting vocational programs
- Provision of new models to encourage young people to widen their occupational considerations and aspirations
- Requirement of in-service education for vocational educators
- A re-examination of the principles of vocational education
- Dissemination of information to help eliminate sex unfairness

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A Study of Our Nation's Schools. George W. Mayeske, Carl E. Wisler, Albert E. Beaton, Jr., Frederic D. Weinfeld, Wallace M. Cohen, Tetsuo Okada, John M. Proshek, and Kenneth A. Tabler. Washington, D.C.: U.S. Department of Health, Education, and Welfare, Office of Education, 1972, 126 pp. (ED 082 312)

Intended as a sequel to the Coleman report, Equality of Educational Opportunity, this study was designed to discover which characteristics of the nation's schools are most closely related to school outcomes. A five per cent stratified cluster sample was taken which resulted in the inclusion in the study of about 650,000 students from approximately 4,000 schools. Information was also collected from their teachers, principals, and superintendents. The questionnaire items related to student social background, school characteristics (facilities, programs, policies, personnel, and personnel expenditures), and school outcomes (student attitudes, motivations, and achievement).

The study concluded that, although schools are important, their influence is bound up with student social background. To gain more knowledge of specific sources of influence, experimental studies of educational innovations were recommended.

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Vocational Education for the Handicapped: A Bibliography of ERIC Documents. Paul E. Schroeder. Columbus: The Center for Vocational and Technical Education, The Ohio State University, August 1973, 33 pp. (ED 083 480)

This annotated bibliography, limited to abstracts from Resources in Education (RIE), consists of documents with "career education," "job training," "manpower development," "vocational education," or "vocational retraining" as the major descriptor. A selection of 37 judged most relevant is included in abstract form according to publication dates from 1970-1972.

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Vocational Education for the Handicapped: A Review. Information Series No. 119. Marc E. Hull. Columbus: The Center for Vocational Education, The Ohio State University, 1977, 64 pp. (ED 149 188)

This paper reviews the role vocational education has played in the career development of the handicapped and discusses the expanded role it must assume. Specific topics are discussed: "A rationale" for the participation of the handicapped in vocational education and barriers to their participation; the impact of legislation on vocational education for the handicapped (P.L. 94-142, 94-482, and 93-112); identifying the handicapped; developing program alternatives; pre-vocational education; inter-agency cooperation; instructional materials; personnel preparation; and program evaluation

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Youth: Transition to Adulthood (Report of the Panel on Youth of the President's Science Advisory Committee). James S. Coleman, chairman. Chicago: University of Chicago Press, 1974, 193 pp.

The stated purposes of this report are "to examine the contexts that now exist for youth, within which they come to adulthood; to assess the fitness of these contexts for the accomplishment of the developments necessary to full maturity; and then to propose alternative settings that seem to be preferable ways of accomplishing that assignment."

Part 2 of the report details the history of age grouping of young people in America, rights of children, demographic characteristics and economic problems of youth, and current status of educational institutions. Issues discussed in Part 3 include various aspects of age segregation in school and in the community, the scope of formal school, and the legal status and rights of youth.

Historically, treatment of youth in American society is viewed as having consisted of two phases--the work phase of the earlier agrarian society and the schooling phase of modern society, wherein young people have been kept in school as long as possible and, consequently, out of the labor force.

Among the proposals for changing to a third phase that would include, but not be limited to, schooling are the following:

- Changing the school structure
- Alternating school and work
- Adding education of youth to the production function of work organizations
- Balancing protection and opportunity rights of young people
- Providing young people with opportunities for public service
- Researching existing institutions and the effects of various environments on youth

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VOCATIONAL EDUCATION OUTCOMES
(Final Report on Year One of the R & D Project "Examining Vocational Education Outcomes and Their Correlates")

Attachment "B"

THESAURUS OF VOCATIONAL EDUCATION OUTCOME QUESTIONS

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PREFACE

This thesaurus of vocational education outcome questions is one of the products of the first year of study on the Project "Examining Vocational Education Outcomes and Their Correlates" undertaken at the National Center for Research in Vocational Education.[1] The long-term goals of this project are: (a) the development of a set of outcome criteria which are appropriate for evaluating vocational education programs; and (b) the identification of program characteristics and other factors significantly correlated to these outcomes.

In general, the purpose of the thesaurus is to provide the vocational education community and other relevant audiences with a comprehensive, organized listing of vocational outcome questions and hypotheses. These were obtained by exploring the literature and through discussions with parties interested in vocational education programs. The functions and possible uses of the thesaurus will be described in more detail in the Introduction which also discusses some of the substantive and stylistic problems that arise in developing a product of this nature. Moreover, Section I includes a discussion of the importance as well as problems of attempting to develop a classification system for categorizing vocational outcomes. It also explains how we have classified outcomes and how this organization of the thesaurus may be used by a reader to locate outcome questions of interest. Section II lists 228 outcome questions, categorized according to education level and other considerations. This Compendium of Vocational Education Outcome Questions is followed by an Index of Specific Topics identifying some outcome questions that relate to a particular topic.

December 1978

Joanne Farley

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[1] Other products of this study include "Examining Vocational Education Outcomes: Perspective on the State of the Art" and "Vocational Education Outcome Studies: An Evaluative Annotated Bibliography Including an Appendix of Key Related Literature." These documents also appear as attachments in the present report.

I. INTRODUCTION AND EXPLANATORY NOTES

Definition and Purpose of the Thesaurus

Vocational education outcomes are broadly defined as the consequences of vocational programs. These consequences include the results of (a) a student's participation in a vocational program, and (b) the existence of ongoing vocational programs in the community. Outcomes may affect an individual student, institutions, society as a whole, or some particular segment of society such as taxpayers, employers, or members of local communities. Vocational programs may be at the secondary or postsecondary level; they include programs for adults and out-of-school youth. All results, consequences, impacts, or effects of vocational education are considered outcomes whether they are positive or negative in nature, intended or unintended, short-term or long-term, economic or noneconomic.

The Oxford English Dictionary defines a thesaurus as "a treasury or storehouse of knowledge as a dictionary, encyclopedia, or the like." The authors of a recently published Evaluation Thesaurus suggest that "Somewhere between a dictionary or glossary and an encyclopedia there is occasionally room for a thesaurus--'a book containing a store of words or information about a particular field or set of concepts' (Webster III)."[2] Implicit in both definitions is the suggestion that some organizing principle exists in a thesaurus that (a) sets the boundaries for inclusion of some information to the exclusion of other information, and (b) provides a means of access to the particular information desired by the reader. Given the above definitions then, a thesaurus of vocational education outcome questions is first, a collection of questions concerning the effects, results, or consequences that are in some way attributable to some aspect of vocational education. Secondly, it is a compilation of outcome questions to which some principle of organization applies that enables a reader to obtain desired information. The basis of organization of the thesaurus will be discussed in more detail below.

Some individuals have argued that the set of vocational education objectives upon which many studies in evaluation have focused is too narrow. Other objectives, they claim, should also be emphasized and studied. Moreover, not all of the consequences of vocational programs are anticipated or identified in advance as objectives. In attempting to formulate and/or evaluate vocational education policy, policy-makers and researchers need to know more about the wide range and diversity of effects of vocational education programs, regardless of whether those effects are related to intended goals or are unintended by-products of vocational education. Hence, it is most important that some kind of identification and articulation of possible vocational education outcomes be developed. A thesaurus of vocational education outcome questions can help in meeting this need. More specifically, a thesaurus of vocational education outcome questions can serve the following functions:

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[2] Michael Scriven and Jane Roth, Evaluation Thesaurus, (Pt. Reyes, Calif.: Edgepress, 1977), Introduction.

1. It can provide policy-makers and others with a comprehensive (but not exhaustive) listing of the possible outcomes that have been specified by persons closely related with vocational education through participation and/or research.

2. By providing policy-makers with information about the range and diversity of possible outcomes, the thesaurus can help them in their consideration of the goals that will be treated as desirable "given" consequences of vocational education policy.

3. Related to these functions is the role the thesaurus can serve in identifying outcomes for policy-makers and others that have gone unnoticed because they were not intended. A good deal of discussion has revolved around the question of how effective vocational education has been in achieving stated goals. However, it can be assumed that aside from the possible occurrence of outcomes that are officially deemed desirable, a host of other outcomes occur that are not anticipated or even recognized. Furthermore, these outcomes may themselves result in "spillover" effects of various kinds--some of which may have significant results that need attention. Hence, recognition and articulation of hitherto unnoticed outcomes could have important policy consequences. Such questions as (1) which outcomes should be included in the set of "desirable and intended" outcomes and (2) what intended outcomes are to be given higher priority than others, cannot be rationally considered without taking into account the full range of outcomes that may possibly occur.

4. In terms of identifying those vocational education outcomes that possibly occur, this thesaurus can provide a valuable source of important and interesting

research topics for investigators of vocational programs. As such the thesaurus can serve as a fruitful starting point from which to begin formulating and testing hypotheses relevant to vocational education processes and outcomes.

5. Moreover, the thesaurus can be used to develop checklists of those outcomes that may have actually been empirically studied and those that have never been seriously investigated.

6. For purposes of studies like that being undertaken by this R&D project, the thesaurus can provide a collection of varied outcome questions from which investigators can select not only interesting outcomes for study but also those that merit special attention due to their significance for assessing and evaluating vocational education. This is an important function because outcomes can serve as criteria or as evaluative standards beyond preannounced program objectives and can stimulate a reexamination of program implementation strategies and overall policy.

7. Finally, the thesaurus can help researchers concerned with particular groups (i.e., women, the physically handicapped, ethnic minorities, etc.) by focusing on specific questions pertinent to such groups. Should vocational programs relevant to these groups be evaluated along the same lines or with the same criteria used in evaluating programs for regular students? Are there some outcomes that affect the members of special groups but not regular students or do outcomes affecting both the former and latter differ in the nature of their impact on and/or significance to these groups? By identifying the outcome hypotheses applying to special groups, the thesaurus can provide a badly needed source of information with which to address these and other questions.

The Development of Outcome Statements and Questions

In developing the thesaurus, the project staff began by collecting a large number of outcome statements that took final form as outcome questions. Before discussing the reasons for reformulating the statements into questions, a brief discussion of the importance of outcome statements will be helpful.

We emphasize that outcome *statements* are different from vocational *outcomes*. The contrast between the two is significant. As defined above, a vocational outcome is some consequence, result, or effect of participation in and/or the existence of vocational education programs. Hence, an outcome is an occurrence that does in fact take place in the world. Indeed, it is quite possible that a number of vocational outcomes exist or occur which may never be perceived or suspected and consequently, about which statements will never be made. By contrast, an outcome statement is a claim about some possible outcome. It is a linguistic description of what is stated to be the case, i.e., a description of the possible outcome that someone is making claims about. Outcome statements may be considered either correct or incorrect (unlike an outcome which does or does not occur). An individual can posit the occurrence of an outcome in an outcome statement but the claim may be wholly inaccurate, partially inaccurate, or wholly accurate. As in the case of all hypothetical claims, statements positing the occurrence of an outcome may be supported by the results of empirical testing. The greater the number of tests that yield positive results in support of a hypothesis is, the greater our confidence in the validity or correctness of the hypothesis will be. Nevertheless, our acceptance of an empirically tested outcome hypothesis will always remain tentative to some degree. This, then, is a thesaurus of vocational education outcome *questions* (or hypotheses) and not a thesaurus of outcomes that are posited as actually occurring.[3]

There is another reason for emphasizing that outcome statements are different from outcomes. Outcome statements not only attempt to articulate and describe the hypothesized outcome in question, but they may well provide us with other information as well. Typically, an outcome statement describes *what* happens to *whom* and *how*, and in some cases also indicates *when*, *where*, and *why*. At a minimum, an outcome statement must make reference to a vocational outcome, an "affected entity" and an "agent." An outcome statement should not be confused with a process or program description. The statement that "vocational programs offer courses in consumer education" is a description of an aspect of vocational processes.

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[3] Hereafter, when referring to outcomes, we will in fact be referring to outcomes as they have appeared in an outcome statement, hypothesis, or question. Hence, if we state that "outcomes can be categorized in a number of ways," the reader should interpret this to refer to *hypothesized* outcomes or outcomes that have been posited as being actual occurrences. Also, for a discussion of the inherently hypothetical nature of all our scientific knowledge, see Karl R. Popper, *The Logic of Scientific Discovery*, rev. ed. (London: Hutchinson and Co., 1968), Chapter 30.

It does not indicate what the effect or the impact of offering such courses might be. By contrast is the statement that "as a result of participating in a vocational program, students acquire consumer education." In the latter, a consequence of the provision by vocational programs of consumer education oourses is being posited. It asserts that students not only utilize these courses but also that students do, in fact, receive a type of training in these courses. This is the "what" of the statement, i.e., the outcome itself.

The "affected entity" of an outcome statement includes the individuals, groups, social institutions, etc., that are most immediately and directly affected by the outcome, whether or not the effect was intended. In the example above, the affected entity is the group of individual vocational students who take courses in consumer education. Sometimes an outcome statement may be interpreted as also having an indirect recipient of the outcome's affect insofar as the outcome will have spill-over effects. For example, it could be suggested that the student's family is also affected by the training he/she receives in consumer education. But in terms of using the statement in this thesaurus, it must at least include reference to some directly affected entity.

Typically, an outcome statement will also indicate the "agent," i.e., that aspect of vocational education which is identified as being the primary causal factor. The agent also indicates that the outcome is brought about as a result of a distinctive educational treatment, i.e., vocational education, which has results for some affected entity. The agent of an outcome statement addresses the question of "how" the outcome comes about. In the example above, the agent identified in the statement is a "vocational program." Sometimes the agent is made more explicit when the statement identifies what or which aspect of vocational programs is responsible for bringing about an outcome. In this sense, then, the agent could be a group of vocational educators, a distinct vocational field, a specific level of vocational education, or some other aspect of the overall vocational education process.

Sometimes an outcome statement will indicate what time perspective should be used in studying a particular outcome. In other words, the statement may suggest that the occurrence of the outcome is short-term and immediate or is long-lasting and is manifested only after some lengthy time interval. The "where" of an outcome statement would include information such as rural or urban programs, inner-city or suburban programs, perhaps different regional programs, etc. In providing the "why" behind an outcome, an outcome statement will sometimes provide the rationale or theoretical basis for expecting the outcome to occur.

The above should demonstrate that outcome statements begin to provide the information needed in order to inquire empirically whether or not the hypothesized outcome occurs, who or what it affects, and so on.

Testable Outcome Hypotheses

As an outcome statement becomes increasingly specific in its description, it usually increasingly takes on the form of a "testable" hypothesis. "Testable" in this sense means that there are some ways of specifying under what conditions we expect the hypothesized outcome to occur. Following Carl Hempel, a philosopher of science, we can say that a testable hypothesis is a statement that can be put into the following explicitly conditional form: If conditions of kind C are realized, then an outcome of kind 0 will occur.[4] Moreover, the statement is such that we can empirically check to see if 0 occurs when conditions of kind C do in fact hold. Although we have rewritten the outcome statements that are presented as outcome questions in this thesaurus as clearly and as specifically as possible, we are aware of the fact that many of them are "outcome hypotheses" but are not necessarily "testable hypotheses." Nevertheless, outcome statements of this latter kind were included as outcome hypotheses or questions because the consistent emphasis they have been given by vocational educators, educational evaluators, and researchers suggests that they are important enough to retain as potential subjects of more thorough study.

There are at least two basic reasons for the lack of a large number of clearly articulated and testable hypotheses about vocational education outcomes. First, the empirical investigations of vocational education outcomes that have been hitherto conducted have been relatively narrow and limited in scope given the widely diverse range of claims that have been made about vocational education outcomes. This is to say only a few vocational education outcomes (usually perceived as goals or intended outcomes) have been empirically studied. Such investigations usually fall into the group of "follow-up studies" of vocational students. Even where this empirical work has been conducted, problems of operationalizing, measuring, and testing vocational outcome hypotheses remain. For example: How does one check the validity of a finding that large numbers of employed vocational students have or have not entered training-related occupations? How should "training-relatedness" be defined? How can we define "vocational education" in such a way that we feel confident that we are testing hypotheses about a distinctive educational treatment? These and other issues have continued to plague investigators of vocational education. Thus, the range of hypotheses formulated for testing has been rather narrow and even where the empirical testing of such hypotheses has been performed, it is sometimes not clear how to interpret the results.[5]

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[4] For a discussion of testability and other methodological issues, see Carl Hempel, Aspects of Scientific Explanation. (New York: The Free Press, 1965).

Another major factor in explaining the problem of compiling a comprehensive list of testable vocational outcome hypotheses has been the lack of attention paid to providing reasons and arguments supporting claims made about vocational outcomes. The ability to test an hypothesis, i.e., to operationalize and measure concepts in a significant way, is closely interrelated with the explanatory context from which that hypothesis is derived. Hence, the claim that "participation in vocational programs causes students to become more alienated from themselves and society" is not very clear until we know what it means to say someone is aliented. Perhaps we all share some kind of intuitive hunch about what we are saying in calling a human being alienated. However, we cannot test vague "hunches" any more than we can test vague statements.

Insofar as the meaning and use of a concept differs between theories (or explanations), the indicators used to measure them will differ too. Since many (certainly not all) of the outcomes attributed to vocational education by both its critics and its advocates are pronouncements rather than explanatory conclusions, the outcome hypotheses will reflect this lack of context and remain difficult to test. However, the fact that many of these "pronouncements" are repeatedly asserted suggests that they tap real concerns and should be noted for future study and development.

The point of this discussion is to indicate some of the problems involved in attempting to render a comprehensive list of outcome statements into testable hypotheses. As noted above, one might think of the claims about outcomes collected in this thesaurus as hypotheses but not necessarily testable hypotheses. To emphasize that the outcome statements that were developed for this thesaurus are not confirmed hypotheses[6] or even in many cases, testable hypotheses, we have rewritten them as outcome questions in the thesaurus. Hence, instead of listing outcome statements like the following: "Participation in vocational programs at the high school level results in shorter job-search time for vocational students than that needed by comparable general/academic students," we have reformulated the statement into a question--"Does participation in vocational programs at the high school level result in shorter job-search time for vocational students than that needed by comparable general/academic students?"[7]

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[5] For further discussion of these issues, see Attachments "A" and "C" in this report.

Origins and Formulation of Outcome Questions

The Outcome questions compiled in this thesaurus were obtained from a variety of sources. Some were obtained during informal conversations with individuals such as vocational educators, vocational administrators, city school superintendents, labor union representatives, business and industry representatives, researchers in vocational education evaluation, and so on. However, most of the outcome questions were developed after exploring a number of written sources. The latter extend in range and scope from educational journal articles to newsletters published by vocational youth organizations.

Citations are not provided for each specific outcome question. There are several reasons for this. First, none of the outcome questions contained in this thesaurus are direct quotations. In many cases, the outcome question was arrived at by making explicit what some source merely implied or suggested while discussing various aspects of vocational processes. As has been indicated, in a great number of cases, outcome statements or hypotheses were found that were so vague and so general as to be almost meaningless except on an intuitive level. These were reformulated in order to render them as understandable to as wide a variety of audiences as possible. However, in reformulating these claims about outcomes, we often had to impose a more explicit interpretation on them and in doing so, may have changed the meaning and intent of the original source. Secondly, a great number of claims about vocational outcomes were repeatedly asserted or suggested by a number of different sources. Hence, it was not clear which one should be cited.

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[6] By "confirmation" is meant obtaining expected test results over numerous testings. Some of the outcome statements included in the thesaurus have been confirmed for a particular testing but none have been confirmed over numerous cases so that we may have a high degree of confidence in their validity.

[7] Another reason that the project staff felt that reformulating the outcome statements into questions was needed was to ensure that no one would misinterpret these statements, thinking mistakenly they might be claims officially propounded by The National Center.

Perhaps the most significant consideration affecting the decision to not cite sources for the outcome questions is the broader context within which this thesaurus may be used. Earlier, we suggested a number of different purposes that a thesaurus of vocational outcome statements can serve. However, all the functions potentially served by the thesaurus rest on the general assumption that each outcome statement (or question) can be treated as an hypothetical claim about the effects of vocational education. For whatever particular purposes an individual may refer to this thesaurus, its general usefulness derives from the fact that it is a compilation of hypothesized relations between vocational programs and educational outcomes which affect individuals, groups, or societal entities.

When dealing with hypotheses (whether in a scientific context or a policy making context) a distinction is sometimes made between the "logic of discovery" and the "logic of justification" (Popper, 1968). The logic of discovery applies to the processes by which hypotheses are initially formulated and in this sense, discovered. There are no formal canons or rules of logic that cover exhaustively the procedures of discovering hypotheses.[8] In contradistinction to the logic of discovery is the logic of justification. Both in sientific practice and in everyday discourse, we can identify a number of formal procedures which can be used to gain acceptance that a conclusion (including that an hypothesis has been confirmed) has in fact been justified or at least reasonably supported. In this context then, we repeat for emphasis, this thesaurus is not a categorized list of confirmed or supported hypotheses about vocational education outcomes. Rather, it is intended to expand awareness of the questions and unconfirmed hypotheses that can guide scientific research, the evaluation of vocational programs, and aid the decisions that policy makers must confront while forming and implementing vocational education policy. Since the literature on vocational education and our discussions with informed individuals has served to stimulate our development of outcome statements and questions rather than to provide authoritative sources, we do not think it necessary or appropriate to single out particular authors or individuals for citation as "discoverers of outcome hypotheses."[9]

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[8] Popper· and other philosophers of science do suggest that an hypotheses whose discovery was guided by working out of a particular theory is generally more acceptable than one that seemingly derives from no particular substantive context.

One publication that merits special comment bears the title "Questions in Vocational Education."[10] Organized around a "systems-oriented conceptual framework," the report identifies six components associated with vocational education; "(1) the context in which vocational education occurs, (2) the inputs into vocational education, (3) the process by which vocational education staff and facilities are structured and organized into programs to provide services, (4) the product or output of vocational education programs, (5) the impact or result of vocational education, and (6) the interrelation between context, input, process, product and impact." Questions concerning vocational outcomes fall into the "product" and "impact" categories of this framework. The thesaurus, on the other hand, is wholly concerned with presenting questions about vocational outcomes. Some of the questions may have indirect or suggestive implications for studying processes or inputs into vocational education. But the thesaurus is limited to presenting a comprehensive list of questions about vocational education *outcomes*.

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[9] Some examples of possible sources for outcome questions or hypotheses include the following: Edwin L. Herr, ed. Vocational Guidance and Human Development (Boston: Houghton Mifflin Co., 1974); James E. Wall, ed. Vocational Education for Special Groups: The Sixth Yearbook of the American Vocational Association, (Washington, D.C.: The American Vocational Association, 1976); and in Attachment "A" of this report, in the Appendix of Key Related Literature, see: Robert P. Quinn and Martha S. Baldi de Mandilovitch, Education and Job Satisfaction: A Questionable Payoff (Washington, D.C.: U. S. Department of Health, Education, and Welfare, The National Institute of Education, March 1977); Grant Venn, "Criteria Against Which Vocational Education Should be Held Accountable," in Interpreting Outcome Measures in Vocational Education: A Final Report, Floyd L. McKinney, Kenney E. Gray, and Marie Abram (Columbus: The Center for Research in Vocational Education, The Ohio State University, 1979, 250-285 pp.); James S. Coleman, Equality of Educational Opportunity, Reconsidered (Baltimore: Johns Hopkins University, 1967); and Leonard A. Lecht, Evaluating Vocational Education--Policies and Plans for the 1970's (With an Annotated Bibliography) (New York: Praeger Publishers, 1974).

[10] Donald W. Drewes and others, Questions in Vocational Education: What Everyone Wants to Know and Is Not Afraid to Ask, Career and Vocational Education Professional Development, Report No. 18 (Raleigh: Center for Occupational Education, North Carolina State University, 1975).

There is a second significant difference between the QVE report and the thesaurus. The questions formulated in the report are oriented to obtaining *descriptive* information, for example, "What is the total number of program completers by type of school?" By contrast, the outcome questions in this thesaurus are oriented toward obtaining *causal* knowledge about vocational outcomes. That is to say, that most of the outcome questions in this manuscript seek to ask whether vocational education as a distinctive educational treatment can be causally linked to particular effects. An example of a causally oriented question is "Are vocational programs more successful in reducing the student dropout rate than general/academic programs?"

The Classification of Outcome Questions

There have been various attempts made to develop a classification framework for organizing and categorizing questions and/or statements about general educational outcomes and vocational outcomes.[11] However, most of these attempts have dealt with anticipated outcomes, desired outcomes, or outcome goals and objectives. As was emphasized above, there is a need for researchers and policy makers to learn more about the whole range of vocational education outcomes. This includes studying both intended and unintended, desirable and non-desirable, long term and short term, economic and non-economic outcomes.

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[11] See, for example, Richard L. Derr. *A Taxonomy of Social Purposes of Public Schools*. (New York: David McKay Co., Inc., 1973). Also, see Morris Coburn, Calude Salem, and Selma Mushkin, *Indicators of Educational Outcome, Fall 1972*, National Center for Education Statistics (Washington, D.C.: U. S. Government Printing Office, 1973); and David R. Krathwohl, Benjamin S. Bloom, and Bertram B. Masia, *Taxonomy of Educational Objectives: The Classification of Educational Goals, Handbook II: Affective Domain* (New York: David McKay Co., Inc., 1964).

Although we have used a classification system to organize the outcome questions in the thesaurus, its development was guided more by pragmatic considerations than by substantive or theoretical criteria. Before proceeding to a description of this framework, it is appropriate to consider the rationale and implications of any classification system. The importance of such a system derives from the role that it serves in contributing to the efforts of vocational education researchers, administrators, and policy-makers. Following are a few of the useful functions a classification framework could perform.

1. A classification scheme would emphasize to other researchers or interested parties that there is a range of diverse outcomes that need attention in important areas of concern to the vocational education community.

2. The development of a framework upon which the classification of outcome statements is based could serve as a theoretical (or explanatory) basis for identifying and specifying those factors that may be causally important in producing specific vocational education outcomes.

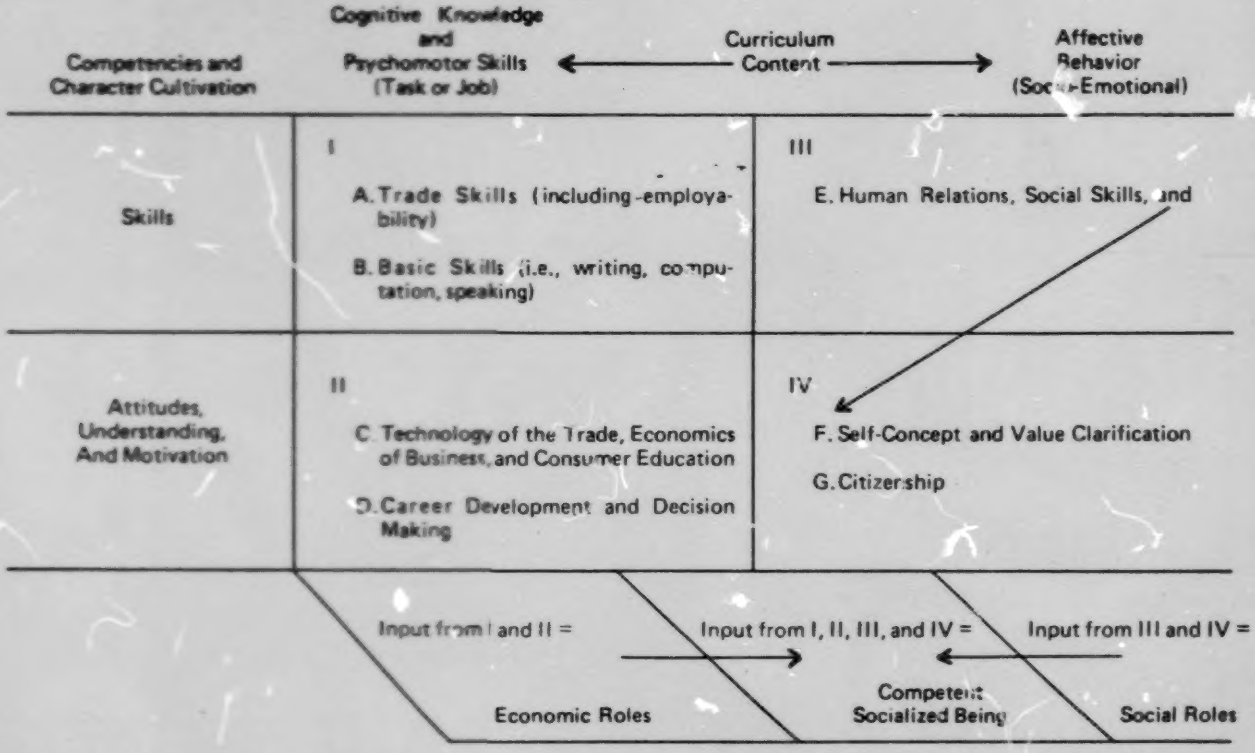
3. A classification scheme would provide the basis for cumulating and organizing the results of evaluative studies and for identifying directions for further efforts.

4. A classification scheme would allow the researcher to more easily (and perhaps more sensitively) compare and contrast outcome statements within and across categories.

As the list above shows, efforts to develop an adequate classification scheme should be intensified. However, despite the potential benefits, there are obstacles to developing an appropriate classification framework.

The imposition of a classification scheme or conceptual framework upon a set of outcome statements will impose a particular perspective or interpretation on each of the statements. Hence, looking at the classification scheme used by Bregman and Frey (see Figure 1) one finds that vocational outcomes are interpreted as being in a major way a result of curriculum content. Also, it can be noted that the range of outcomes that can usefully be categorized in this classification are those that deal with individual-level skills, competencies, and so on. In other words, there is no room for categorizing outcomes that are thought to affect

Classifying Desired Vocational Outcomes in Relation to Individual Competencies and Character Cultivation



← Curriculum Content →

Competencies and Character Cultivation	Cognitive Knowledge and Psychomotor Skills (Task or Job)	Affective Behavior (Socio-Emotional)
Skills	I A. Trade Skills (including employability) B. Basic Skills (i.e., writing, computation, speaking)	III E. Human Relations, Social Skills, and
Attitudes, Understanding, And Motivation	II C. Technology of the Trade, Economics of Business, and Consumer Education D. Career Development and Decision Making	IV F. Self-Concept and Value Clarification G. Citizenship

Input from I and II = Economic Roles

Input from I, II, III, and IV = Competent Socialized Being

Input from III and IV = Social Roles

From Ralph Bregman and Verna Frey, "Vocational Education: An Alternative Rehabilitation Mode for Correctional Institutions" in Vocational Education for Special Groups: Sixth Yearbook of the American Vocational Association, James E. Wall, ed. (Washington, D.C.: The American Vocational Association, 1976, p. 170).

Figure 1

institutions or functional characteristics of the society at large. Hence, the classification framework suggested in Figure 1, has an individualistic focus and curriculum bias, and outcomes or outcome statements are likely to be interpreted on that basis.

The way in which we "slice up the world" in a classification scheme has other important implications. In effect, it demarcates or delimits those aspects of the subject matter that are somehow judged to be "important" or "appropriate." To refer again to an example, the "matrix of expected outcomes" suggested by Jerome Moss, Jr., is multi-dimensional (see Figure 2). Only two of the dimensions need to be discussed here. One axis of the matrix demarcates the relevant targets (or affected entities) to be considered, i.e., it demarcates who or what needs to be taken into consideration in studying vocational outcomes. In this case, Moss suggests that we utilize two categories--"Students" and "Other." Moss explained the distinction and categories by stating that:

> "A second axis, for target, distinguishes between expected student (and former student) outcomes, and indirect, secondary, or feedback outcomes anticipated in other people, agencies, or institutions."[12]

Note that in establishing these conceptual categories the way he has, Moss has developed a classification that implies that outcomes directly affecting students are of considerable importance but not those directly affecting persons, institutions, etc., that fall into the category of "Other." Indeed, outcomes that may be conceptualized as directly affecting non-students, institutions, etc., are excluded from this classification framework. Moreover, the fact that so many potential targets are lumped together in the category "Other" while "Students" are clearly distinguished demonstrates the priority that the classification tends to give to outcomes affecting students.

Along a second axis, Moss uses three categories to distinguish possible outcome types--"Educational," "Psychosocial," and "Economic." Insofar as he has included these particular categories while excluding others (e.g., Political), he has built into his matrix distinctions that demarcate the types of outcomes that are relevant and appropriate for study.

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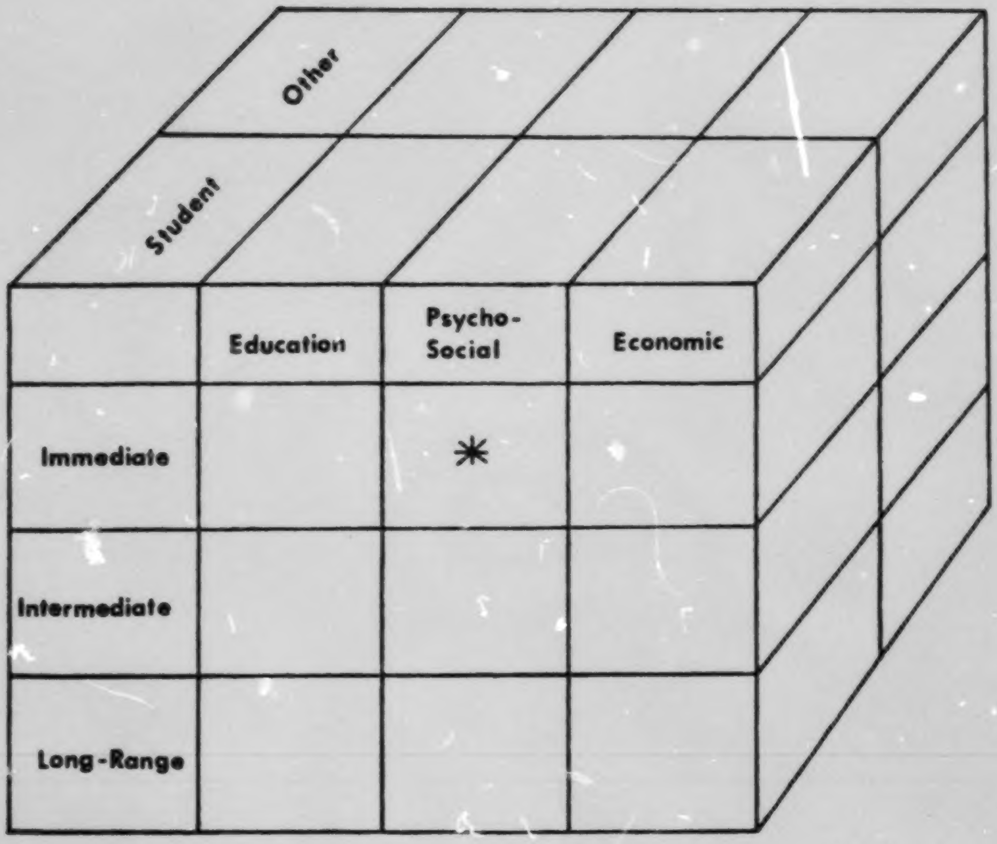
[12] Jerome Moss, Jr., The Evaluation of Occupational Education Programs, Technical Report (Minneapolis: Research Coordinating Unit in Occupational Education, University of Minnesota, September, 1968), p. 10.

Matrix of Expected Outcomes



* Both Qualitative and Quantitative Outcomes are Entered in Each Cell.

From Jerome Moss, Jr., The Evaluation of Occupational Education Programs, Technical Report (Minneapolis: Research Coordination Unit in Occupational Education, University of Minnesota, September 1968), p. 9.

Figure 2

In attempting to understand the implications of saying that one outcome has "relevance" or "importance" while another may not, one almost inevitably begins to equate these terms with desirability. Indeed, Moss had quite explicitly developed his matrix on the basis of desirable and hence, relevant categories. Likewise, in reviewing the classification scheme in Figure 1, we see that the hypothesized relations between curriculum content and types of outcomes result in a "Competent Socialized Being." It is clear that Bregman and Frey are making conceptual distinctions in terms of what will contribute to the development of their idea of what constitutes a competent, socialized individual.

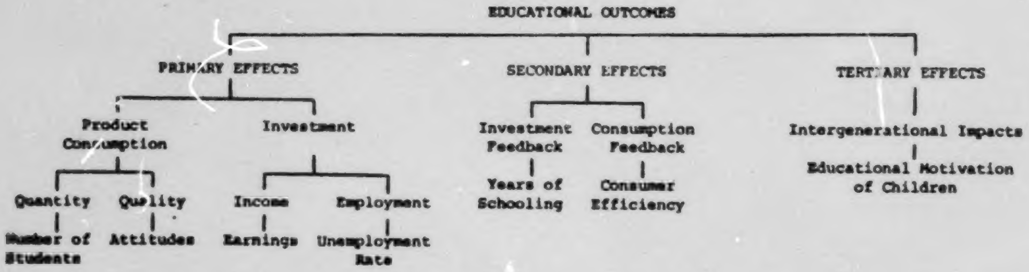
Indeed, most of the classification frameworks developed for dealing with outcomes have been developed with the explicit purpose of dealing with desired and/or expected outcomes. It has been suggested throughout this discussion that decisions concerning which outcomes are relevant for consideration as goals and as evaluation criteria will be improved if an expanded awareness of the range and diversity of outcomes is developed. This suggests that a classification framework is needed that is capable of conceptually organizing all kinds of outcomes and not just those that are deemed as desirable and/or expected. Figure 3 is one of the few examples we found that can do this. To be sure, such a framework would be establishing distinctions of relevance. However, the force of "relevance" here becomes that of concern because it makes a difference in some way to human beings. Whether the difference an outcome makes is judged desirable or undesirable will depend on the particular use to which the framework is put. In any case, relevance in this sense cannot simply be equated with goals, or the "good," or the "desirable."

Because of the problems and the seriousness of the implications, we have chosen to organize the thesaurus around a classification system which has been developed with the pragmatic consideration in mind of how to provide users with convenient access to outcome questions of interest. Hence, the next section will explain how the thesaurus has been organized and how it might be used.

Use of the Thesaurus

With a compendium of over two hundred outcome questions, it was felt that the reader could easily be overwhelmed in attempting to read through the list. Hence, a method of breaking down the questions into manageable sub-sets seemed desirable. The classification system chosen to enable us to do this is by no means a reflection of the project's conceptual or theoretical assumptions although, as discussed

Classification of Educational Outcomes in a Sequence of Time Phases



From Morris Cobern, Claude Salem, and Selma Mushkin (1973), Indicators of Educators of Educational Outcome, Fall 1972, National Center for Education Statistics (Washington, D.C.: U. S. Government Printing Office, 1973, p. 7)

Figure 3

above, it is not free of suggesting ways in which outcomes might be studied. However, emphasis should be placed on the fact that it was chosen more for its practical utility than for any research-directing implications it might have. With that caveat in mind, an outline in the classification is provided below.

A. Outcome Questions Having the Individual as Affected Entity
    (1) Secondary School Level
        (a) Related Directly to Economic or Occupational Roles
        (b) Related Predominantly to Non-economic Roles
    (2) Postsecondary School Level[13]
        (a) Related Directly to Economic or Occupational Roles
    (3) Not Differentiated by School Level
        (a) Related Directly to Economic or Occupational Roles
        (b) Related Predominantly to Non-economic Roles

B. Outcome Questions Having Social Entities or Society-in-General as Affected Entities.[14]
    (1) Related Directly to Economic Sphere
    (2) Related Predominantly to Non-economic Sphere

C. Outcome Questions Having Special Needs Subpopulations (or Members Thereof) as Affected Etntities
    (1) Related Directly to Economic or Occupational Roles
    (2) Related Predominantly to Non-economic Roles

This system differentiates outcome questions in basically three ways. First, it distinguishes the outcome questions with respect to the affected entity of the outcome, i.e., the individuals, groups, institutions, or social entities that are most directly affected by the outcome in question. Following are the distinctions made with respect to the affected object. First, there are those outcome questions having the individual as affected entity. These questions might refer to former or present students, parents, employers, etc. The point, however, is that the locus of affect of the outcome is the individual. Secondly, there are outcome questions having social entities or society-in-general as the affected entity. Instances of this are when institutions, local communities, or organized groups are being posited as the locus of the outcome's effects. Finally, there are outcome questions having particular relevance for special needs subpopulations as including the following groups: blacks, the disadvantaged, ethnic and/or linguistic minorities, out-of-school youths, women, native Americans, older workers, ex-offenders, migrants, and the mentally or emotionally or physically handicapped. It should be noted that the outcome questions having the individual as the affected entity are not mutually exclusive from those having members of special needs groups as the affected entity. We have distinguished between the two on the practical basis that many researchers and policy makers are interested in outcomes affecting individuals as members of special needs subpopulations and not as members of the general public.

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[13] A category for outcome questions related predominantly to non-economic roles should logically proceed A.2.a. It has been omitted because we have no entries for it in our sample of outcome questions. The same holds true for the omission in this framework of categories for adult vocational programs or programs for out-of-school youths.

[14] Differentiation by school levels should be included as categories but have been omitted due to lack of entries in our sample. This is also true of both major categories containing questions that have special needs groups as the affected entities.

A second method of differentiating outcome questions is based on differences in school level, i.e., secondary and postsecondary. It has been suggested that differences in school level may be associated with differences in the nature and frequency of occurrence of vocational outcomes. This may or may not be the case. However, we distinguished questions by school level because for various purposes, individuals desire or need to inquire into vocational programs at different school levels. Thus, where one person might be solely interested in evaluating outcomes at the secondary school level, another might be focusing on adult vocational programs.

The third distinction utilized in the classification system is perhaps the most likely to cause disagreement or unease among readers. This is the distinction between those outcome questions which we have labeled as economically or occupationally related and those labeled noneconomically related. Although it is always difficult to separate the "economic" from the "social," "political," and even "psychological," aspects of human life, we have tried to resolve this problem by applying the distinction in a fairly narrow manner. "Economic or occupational-related roles or spheres" should be interpreted in the thesaurus to apply to those outcome questions which are explicitly related to employability, employment, wage rates, economic resource levels, and so on. However, an outcome that on the face of it seems to be obviously economic in nature, e.g., employment/unemployment rates for vocational graduates, may have serious social and political implications as well. Hence, the reader is forewarned against assuming that the way in which we have distinguished between economic and noneconomic outcome questions is meant to be in any way definitive. Again, this distinction was used mainly because it seemed to provide the practical advantage of categorizing the outcome questions in an accessible manner for readers.

Having differentiated the outcome questions on the basis of affected entity, school level, and whether the outcome is economic or non-economic in nature, the resulting organization of the outcome questions is made more manageable.

Moreover, for those persons interested in a particular topic, we have provided an index of specific topics which follows the compendium of outcome questions. Although the list of topics and sub-headings is not exhaustive, we have tried to include those that are relevant to the concerns and interests of individuals involved in the area of vocational education.

The outcome questions in the compendium have been numbered for identification sequentially, beginning with #1 and extending to #228. Although it is hoped that most of the major topics relevant to vocational education are included in the index, it is not exhaustive with regard to the possible topics that could have been included. Lastly, topics have been cross-referenced where it seemed advisable and/or appropriate. The major topic headings are arranged in alphabetical order, followed by the identification numbers preceding each outcome question in the compendium. For example, if the earnings of vocational students is the topic of interest, a reader would find "earnings" entered in the index in the following way:

> Earnings, of vocational students, 38, 39, 40, 88, 89,
> 90, 91, 92, ...

The reader can then refer to the outcome questions having the identification numbers listed after the topic. We have not exhaustively listed every outcome question potentially related to a specific topic. In obvious cases this has been represented by a series of periods following the last identification number listed. For example, given the large number of questions dealing with "postsecondary" students, "postsecondary has been entered as below:

> Postsecondary education, vocational, 30, 31, 32, 33,
> 34, ...

The reader is encouraged to scan the list to insure that all outcome questions relevant to the topic of interest have been noticed.

II. COMPENDIUM OF VOCATIONAL EDUCATION OUTCOME QUESTIONS

A. OUTCOME QUESTIONS HAVING THE INDIVIDUAL AS THE AFFECTED ENTITY;

(1) SECONDARY SCHOOL LEVEL;

(a) DIRECTLY RELATED TO ECONOMIC OR OCCUPATIONAL ROLE

1. Outcome Question: Does participation in vocational programs at the high school level result in a satisfactory number of the graduates obtaining their first full-time employment in training-related fields?

2. Outcome Question: Does participation in vocational programs at the high school level instill the belief in students whose first job is training-related that they have been well prepared for their jobs?

3. Outcome Question: Are the returns from individual investments in vocational education higher than returns made by individuals in general/academic programs below the baccalaureate level?[1]

4. Outcome Question: Does participation in Distributive or Trade and Industry programs at the high school level result in more students having jobs lined up for starting work immediately after program completion than do comparable students in other vocational programs?[2]

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[1] When a contrast group is referred to in an outcome question like the above, it is assumed that the comparison is being made for groups whose members are matched in sex, age, mental ability and socioeconomic background.

[2] In a number of the outcome questions, the reasoning behind citing a specific vocational program (or a specific time period as in question #8) will not be obvious. Nevertheless, we have retained these formulations of the questions as a way of suggesting that new outcomes might be identified by thinking in terms of the outcomes that are possibly associated with different programs. Moreover, the different time perspectives we associate with hypothesized outcomes may possibly generate new ideas and outcomes. (Refer to discussion in Introduction.)

5. Outcome Question: Does graduation from vocational programs at the high school level result in lower rates of unemployment for students than those for general/academic high school graduates?

6. Outcome Question: Do graduates of vocational programs encounter fewer periods of unemployment than graduates of general/academic high school programs?

7. Outcome Question: Does graduation from a vocational program at the high school level result in briefer periods of unemployment than graduation from general/academic programs?

8. Outcome Question: Does participation in Health programs at the high school and community college level result in program completers spending more time than completers of other programs at comparable school levels in full-time, permanent employment during the first three years after program completion?

9. Outcome Question: Do graduates of Technical or Trade and Industry programs at the high school level express greater dissatisfaction with their first full-time job than graduates of other vocational programs at the same level?

10. Outcome Question: Do graduates of Agricultural programs at the high school level obtain jobs with lower socioeconomic status than graduates of all other vocational program areas at all other school levels?

A. OUTCOME QUESTIONS HAVING THE INDIVIDUAL AS THE AFFECTED ENTITY;

(1) SECONDARY SCHOOL LEVEL;

(b) RELATED PREDOMINANTLY TO NON-ECONOMIC ROLES

11. Outcome Question: Does participation in vocational programs and affiliated youth organizations result in students having experiences that enhance their ability to respond appropriately to a variety of social situations?[3]

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[3] When an outcome question does not explicitly refer to the secondary school level but does refer to "youths" or "youth organizations" affiliated with vocational programs, we have categorized it under secondary school level.

12. Outcome Question: Does participation in youth organizations develop in students leadership capabilities in planning and implementing small-group activities?

13. Outcome Question: Does participation in vocational programs and affiliated youth organizations develop in students the capacity to be self-directed and responsible in pursuing both occupational and non-occupational goals?

14. Outcome Question: Does participation in vocational organizations develop in students a personal interest in affairs extending beyond the confines of the local community?

15. Outcome Question: Does participation in vocational programs and affiliated youth organizations develop in youths a sense of responsibility for the welfare of others?

16. Outcome Question: Does participation in vocational programs and affiliated youth organizations motivate and prepare students to enter into voluntary, social service activities more so than does participation in general/academic programs by comparable students?

17. Outcome Question: By providing some sort of financial income, do cooperative vocational programs develop the students' independence and ability to assume responsibility outside the parental environment?

18. Outcome Question: Does participation in vocational education and affiliated youth organizations develop in students the personal qualities needed for successful work entry and the assumption of responsibility as citizens and family members?

19. Outcome Question: Does participation in activities by vocational programs and affiliated youth organizations enable young persons to establish an appropriate balance between work and leisure and to select leisure activities appropriate to their life styles?

20. Outcome Question: Does participation in vocational programs make the emotional and psychological transition from adolescence to adulthood easier for the student than participation in general/academic programs?

21. Outcome Question: Have residential vocational schools provided youths with new opportunities by removing many of them from the care of unfit, uninterested parents and from overcrowded, impoverished neighborhoods where the temptation of delinquency and crime is strong?

22. Outcome Question: Are vocational programs at the high school level more successful in reducing the student dropout rate to a lower level than that found in general/academic high schools without vocational programs?

23. Outcome Question: Are students who participate in vocational programs at the high school and postsecondary level more persistent in their desire to complete their programs of study than are those enrolled in general/academic programs?[4]

24. Outcome Question: Does participation in vocational programs at the high school level create a desire in students for postsecondary schooling, especially in a field of study parallel to their high school programs?

25. Outcome Question: Do students of vocational programs at the secondary level evaluate their overall high school experience more positively than do comparable general/academic students?

26. Outcome Question: Does graduation from a vocational program at the high school level cause students to be rejected for entry into many two-year, postsecondary institutions on the basis of unacceptable credits?

27. Outcome Question: Does graduation from a vocational program at the high school level result in students having insufficient or non-acceptable credits for admission to a four-year academic/general college?

28. Outcome Question: Does participation in vocational programs at the high school level motivate graduates to enroll in postsecondary programs (e.g., colleges, universities, community colleges, vocational-technical schools, etc.)?

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[4] Outcome questions that pertain to both the secondary and postsecondary school levels have been categorized under secondary school level and are not listed again.

29. Outcome Question: Does graduation from vocational high schools enable students to be admitted to many community colleges without taking "challenge exams"?

A. OUTCOME QUESTIONS HAVING THE INDIVIDUAL AS THE AFFECTED ENTITY;

(2) POSTSECONDARY SCHOOL LEVEL;

(a) RELATED DIRECTLY TO ECONOMIC OR OCCUPATIONAL ROLES

30. Outcome Question: Do students participating in vocational programs at the community college level rate the quality of their vocational instruction higher than the instruction in the academic subjects which are a part of their curriculum?

31. Outcome Question: Do graduates of vocational programs at the postsecondary, non-college level rate their instruction higher in quality than graduates of high school vocational programs?

32. Outcome Question: Do students, in their first training-related jobs after completing postsecondary, non-college vocational programs consider themselves well prepared for their first job?

33. Outcome Question: Does participation in vocational programs at the postsecondary level lead students to believe they would not have gotten their first full-time employment without the postsecondary training?

34. Outcome Question: Do students, after completing a post-secondary vocational program, spend more of the subsequent three years in full-time employment than those who complete high school vocational programs?

35. Outcome Question: Does graduation from vocational programs at the postsecondary, non-college level result in lower rates of employment for graduates for the first three years after graduation than those for graduates of programs at other levels?

36. Outcome Question: Does participation in Agricultural, Technical, or Health programs at the community college and postsecondary, non-college levels contribute to the student's ability to retain a job received prior to graduation?

37. Outcome Question: Does participation in vocational programs at the postsecondary, non-college level result in a decline in the proportion of graduates holding training-related jobs three years after graduation?

38. Outcome Question: Does graduation from a vocational program at the postsecondary level ensure that graduates will receive higher hourly wage rates on their first job than those received by high school vocational graduates?

39. Outcome Question: Does graduation from a vocational program at the community college level lead to better increases in hourly wage rates for graduates in the first three years after graduation than for graduates of postsecondary, non-vocational programs?

40. Outcome Question: Does graduation from vocational programs at the postsecondary, non-college level generally provide graduates with advantages (e.g., higher paying jobs, more prestigious jobs, etc.) over students graduating from high school vocational programs?

41. Outcome Question: Do graduates of vocational programs at the community collegel level obtain better jobs with higher socioeconomic status within three years of graduation than those obtained by graduates of postsecondary, non-college programs and by high school graduates?

42. Outcome Question: Does graduation from Agricultural programs at the postsecondary, non-college level lead to jobs with higher socioeconomic status than jobs obtained by Agricultural program graduates at the high school and community college levels?

43. Outcome Question: In general, does participation in vocational programs at the community college level contribute to greater job satisfaction among employed graduates than that found among graduates of postsecondary, non-college and high school programs?

44. Outcome Question: Does participation in vocational programs at the community college level contribute to greater job dissatisfaction among male graduates than among female graduates at the same level?

45. Outcome Question: Does participation in male-dominated vocational programs (e.g., Trade and Industry, Distributive, or Technical) at the community college level contribute to greater job dissatisfaction among female graduates than that found among male graduates of the same program?

46. Outcome Question: Does participation in Distributive programs at the postsecondary, non-college level contribute to greater job dissatisfaction among employed graduates than that found among employed graduates of other vocational programs at the same level?

A. OUTCOME QUESTIONS HAVING THE INDIVIDUAL AS THE AFFECTED ENTITY;

(3) NOT DIFFERENTIATED BY SCHOOL LEVEL;

(a) RELATED DIRECTLY TO ECONOMIC OR OCCUPATIONAL ROLES

47. Outcome Question: Does participation in vocational programs produce students who are certifiable as occupationally proficient and ready for entry-level employment upon program completion?

48. Outcome Question: Does participation in vocational programs result in students who are "late program leavers" but not program completers receiving marketable skills which enhance their employability?

49. Outcome Question: Does participation in vocational programs result in students acquiring psychomotor skills, e.g., hammering, typing, and plowing, which are necessary for many forms of occupational competence?

50. Outcome Question: Does participation in vocational programs enable students to learn employment skills and basic work disciplines in a more effective manner than persons who learn such skills from on-the-job training in industry?

51. Outcome Question: Of all vocational program graduates, do those trained in Health programs receive the highest proportion of training-related jobs as first employment?

52. Outcome Question: Does participation in Agriculture programs as compared to other vocational programs result in the smallest proportion obtaining their

first full-time employment in training-related fields?

53. Outcome Question: Are students trained in vocational programs better able to apply the diverse occupational skills learned in school than graduates of general/academic schools?

54. Outcome Question: As a result of participation in vocational programs, do students acquire safe working habits and techniques, thereby reducing physical risks to their co-workers and themselves?

55. Outcome Question: Does participation in vocational programs produce students with a substantial and stable set of behaviors which underly all the professional, skilled, and technical occupations?

56. Outcome Question: Does participation in vocational education provide students with the skills, understandings, and appreciations needed to upgrade or update their occupational competence?

57. Outcome Question: Does participation in vocational programs produce students with transferable skills, thereby increasing their chances of successful employment even in fields outside those in which training was received?[5]

58. Outcome Question: Does participation in vocational programs produce students with skills so specific and specialized that their occupational options become narrowly restricted and inflexible?

59. Outcome Question: Does participation in vocational programs produce students with general transferable skills, thus enabling them to adapt quickly and successfully to changing technological and skill requirements?

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[5] This outcome question, like several others, has two facets: Do vocational students receive transferable skills from participating in vocational programs; and, if so, do these skills really increase their chances of successful employment in fields other than those in which they were trained? Readers are not being asked to assume a positive answer to the first question and then to focus on the second question. The entire question is hypothetical, requiring further attention. This is true for all compound, complex questions in the Thesaurus.

60. Outcome Question: Are many vocational programs tied so closely to local needs and opportunities that the student's future ability to become occupationally mobile is limited?

61. Outcome Question: Does participation in vocational programs produce students with training and skills that will enable them to become geographically mobile?

62. Outcome Question: Does an understanding of the aging process acquired through short Home Economics courses in gerontology prepare students for jobs which involve working with the elderly?

63. Outcome Question: Does participation in vocational programs discourage students from obtaining training in areas identified as declining occupations?

64. Outcome Question: Does participation in vocational programs develop in students a greater awareness of the occupational options available in the work world than the awareness held by comparable students of general/academic programs?

65. Outcome Question: Does participation in vocational programs enhance the students' understanding of their educational and career opportunities, thus enabling them to formulate more realistic goals for the future?

66. Outcome Question: Do vocational educators and counselors impose occupational decisions on youths before they have sufficient understanding and knowledge of occupational options on which to base their own decisions?

67. Outcome Question: Does participation in vocational programs make students aware of the training required for pursuing various occupations?

68. Outcome Question: Does participation in vocational programs enable students to make sound decisions about particular occupations based on their explorations of alternative occupations in school?

69. Outcome Question: Does the organization of many vocational program curricula cause students to be tracked into specific occupations?

70. Outcome Question: Do the curricula of many vocational programs produce students trained in occupations with severely limited or diminishing job opportunities?

71. Outcome Question: Do students through their participation in vocational programs acquire skills that are (or soon will be) obsolete in terms of labor market demand?

72. Outcome Question: Do students, by participation in vocational programs, receive help from a structured, career guidance program?

73. Outcome Question: Are employers now imposing higher educational requirements for jobs because vocational programs continue to supply a pool of trained workers?

74. Outcome Question: Does participation in vocational programs create a greater awareness in students of the necessity of learning basic academic skills in becoming employable than the awareness developed in comparable general/academic students?

75. Outcome Question: Do vocational graduates usually resort to self job-placement because vocational placement offices are ineffective in finding jobs for students?

76. Outcome Question: Does participation in vocational programs enable students to operate successfully in the labor market?

77. Outcome Question: Do students through participation in vocational programs acquire employment survival skills which contribute to their success in retaining jobs?

78. Outcome Question: Do students through participation in cooperative vocational programs usually enter the labor market with good work records in hand?

79. Outcome Question: Does participation in vocational programs prepare students who are entering nontraditional roles with coping competencies as well as the necessary occupational skills?

80. Outcome Question: Does participation in vocational programs enable students to acquire job-seeking skills such as how to write a resume and where to look for job opportunities?

81. Outcome Question: Does participation in vocational programs prepare students to learn from prospective employers whether a job is appropriate to their skills, job expectations and desires, and physical or economic needs?

82. Outcome Question: Does participation in a vocational program enable students to learn how to approach and interview prospective employers?

83. Outcome Question: Do students entering the work force directly after graduation from vocational programs (at all levels) face shorter periods of job-search time than comparable students completing general/academic prgrams?

84. Outcome Question: Does participation in vocational programs motivate graduates to be more persistent in job-hunting after leaving school than general/academic graduates?

85. Outcome Question: Does participation in vocational programs (at all levels) result in students being more satisfied with their jobs two years after graduation than comparable general/academic students holding similar jobs?

86. Outcome Question: Does participation in Health programs (at all levels) result in graduates better satisfied with their first full-time jobs than graduates of other vocational programs at all levels?

87. Outcome Question: Does participation in vocational programs result in employers rating vocational students as being more satisfactory as entry-level employees than comparable general/academic students?

88. Outcome Question: Does graduation from vocational programs (regardless of school level) result in higher hourly wage rates for graduates in the first three years after graduation than graduation from general/academic programs at comparable school levels?

89. Outcome Question: Does graduation from an Agricultural program result in a higher mean hourly wage rate for graduates on their first full-time job than graduation from other vocational programs?

90. Outcome Question: Does participation in vocational programs result in greater increases in hourly wage

rates for those graduates working in training-related areas than those received by vocational graduates working in non-training related areas?

91. Outcome Question: Does participation in cooperative programs in vocational education enable students who are forced to work for economic reasons to earn while receiving vocational training?

92. Outcome Question: Does participation in vocational programs result in a decrease in earnings of vocational graduates in the ten years following graduation relative to the earnings of general/academic college graduates?

93. Outcome Question: Does graduation from a vocational program in an urban school result in higher wages and earnings on a student's first full-time job than those received by graduates of vocational programs located in rural schools?

94. Outcome Question: Does participation in and graduation from Office, Technical, or Distributive programs result in jobs with a higher socioeconomic status for graduates than the jobs obtained by graduates from other vocational programs?

95. Outcome Question: By participating in vocational programs, do program completers move to better paying and more prestigious jobs (with greater opportunities for advancement) than comparable general/academic program graduates?

96. Outcome Question: Do students, as a result of participation in vocational programs, become absorbed in program activities which keep them out of the labor force entirely or limit their labor force participation to part-time employment?

97. Outcome Question: Does participation in a vocational program at any school level result in longer tenure for graduates on their first full-time job than for general/academic graduates at comparable school levels?

98. Outcome Question: Do vocational programs perpetuate the tendency of vocational educators, administrators, and society at large to regard and treat vocational students as human resources whose economic value can be enhanced by selective educational investments?

99. Outcome Question: Does participation in vocational programs result in students coming to regard themselves as human resources whose economic value can be increased by selective educational investments?

100. Outcome Question: Does vocational education foster parent-student discussion of the student's future plans (e.g., college, postsecondary vocational training, etc.) because it involves parents in the development and implementation of career guidance programs?

A. OUTCOME QUESTIONS HAVING THE INDIVIDUAL AS THE AFFECTED ENTITY;

(3) NOT DIFFERENTIATED BY SCHOOL LEVEL;

(b) RELATED PREDOMINANTLY TO NON-ECONOMIC ROLES

101. Outcome Question: Does participation in vocational programs develop in students a greater appreciation for learning in general than does participation in general/academic programs?

102. Outcome Question: Does participation in vocational programs provide students with individualized instruction which minimizes the learning problems created by differences in background and learning abilities?

103. Outcome Question: Does vocational education in general provide students with training lower in quality than that provided by college preparatory programs?

104. Outcome Question: Do vocational students experience self-diminishing failure less often than do general/academic students because vocational programs are tailored to meet the student's individual needs and abilities and are organized to ensure success?

105. Outcome Question: Does participation in vocational programs on the high school level contribute measurably to the moral development of students?

106. Outcome Question: As a result of their participation in vocational programs at all school levels, do students respond well to teachers on the level of personal relations since they have shared interests in the particular vocational program?

107. Outcome Question: Does participation in vocational programs motivate students to stay in school?

108. Outcome Question: Does participation in vocational programs result in students learning to take pride in their work?

109. Outcome Question: Through participation in vocational programs, do students become aware of the means by which they can continue their learning outside of the formal system of schooling?

110. Outcome Question: By participating in vocational programs do students learn technical skills which provide them many consumer benefits?

111. Outcome Question: Does participation in vocational programs afford students training in consumer education as part of the total instructional program?

112. Outcome Question: Does participation in vocational programs enable students to become more efficient in their use of external resources?

113. Outcome Question: Does participation in vocational programs contribute to the student's development of personal economic stability?

114. Outcome Question: Does participation in vocational programs develop in students new material wants and needs and in so doing, develop heightened expectations concerning the students' abilities to satisfy these wants and needs after program completion?

115. Outcome Question: Does participation in vocational programs develop in students a higher sense of personal growth and significance derived from working in occupations of their own choosing?

116. Outcome Question: Does participation in vocational programs acquaint students with the scientific and social bases and learnings of their occupational pursuits such that they will not inevitably sink to the role of appendages to the machines they operate?

117. Outcome Question: Do vocational program participants become or remain more alienated from the society in which they live than comparable general/academic students?

118. Outcome Question: Does participation in vocational programs result in students becoming or remaining more alienated from themselves than do comparable academic students?

119. Outcome Question: Does participation in vocational programs prepare students to work independently, thereby reducing the need for constant supervision and/or instruction?

120. Outcome Question: Do students in vocational programs become increasingly responsible by executing specific work tasks assigned as training experiences?

121. Outcome Question: Do students in vocational education learn teamwork and leadership skills by pursuing interdependent activities with collective goals as training experiences?

122. Outcome Question: Does participation in vocational programs enable students to form sound judgments with regard to career-related choices?

123. Outcome Question: Does participation in a vocational program lead students, through their group task assignments, to tolerate and appreciate differences in opinions and/or strategies for problem solution?

124. Outcome Question: Does participation in a vocational program develop within its students a greater capacity to organize and utilize their intellectual resources for problem-solving than participation in a matched cohort of general/academic students?

125. Outcome Question: Do students, as a result of participation in vocational courses based on self-teaching perform better in original and self-expressive activities, indicating facility with inventive thinking that explores original and/or alternative solutions to problems?

126. Outcome Question: Does participating in a vocational program develop in students the ability to evaluate ideas, situations, or data in terms of meaningful criteria, both objective and subjective?

127. Outcome Question: Does participation in vocational programs help students improve their communication skills, e.g., receiving and transmitting messages, receiving and interpreting information, getting a point across to listeners?

128. Outcome Question: Do vocational programs, by socializing individuals into the mainstream culture, create and/or reinforce their desire to establish and maintain a stable family life?

129. Outcome Question: Does participation in vocational programs develop in students improved self-identity, self-esteem, and self-confidence?

130. Outcome Question: Do students through participation in vocational programs become steretoyped as "underachievers" or as persons who cannot succeed in a college-preparatory program?

131. Outcome Question: Do students through participation in vocational programs develop attitudes which lead them to accept some regimentation on the job?

132. Outcome Question: Does participation in vocational programs lead students to develop good interpersonal relationships with persons of different ages, subcultures, and social classes?

133. Outcome Question: Do vocational programs reinforce racial prejudice among students in public education?

134. Outcome Question: Does participation in vocational programs develop within students the desire and ability to integrate their occupational pursuits with their cultural, philosophical, and intellectual interests?

135. Outcome Question: Does participation in vocational programs lead students to an understanding of the complexity of the industrial and post-industrial system?

136. Outcome Question: Do students, as a result of their participation in vocational programs, develop informed opinions about complex social, economic, and political issues arising in industrial society?

137. Outcome Question: Does participation in vocational programs lead students to participate actively in civic affairs and political life because of self-confidence acquired in school?

138. Outcome Question: Do students, through participation in a vocational program, develop knowledge and appreciation of their rights and duties as a citizen?

139. Outcome Question: Does vocational education strengthen parental support for particular vocational programs by involving the parents in the development and implementation of career guidance programs?

140. Outcome Question: Has vocational education generated more approval and satisfaction among parents regarding its curricula than have general/academic schools?

B. OUTCOME QUESTIONS HAVING SOCIAL INSTITUTIONS OR SOCIETY-IN-GENERAL AS THE AFFECTED ENTITIES;

(1) RELATED DIRECTLY TO ECONOMIC SPHERE

141. Outcome Question: Does vocational education, through its consultative services, help small businesses in urban areas remain in operation; thereby maintaining jobs and creating new ones?

142. Outcome Question: Does vocational education influence job creation by interacting with those developments that create jobs, e.g., since natural resources are developed when water drillers are trained, are more jobs thereby created?

143. Outcome Question: Does the establishment of vocational education systems provide benefits in the form of jobs for suppliers of equipment and job support services used in vocational education?

144. Outcome Question: Does vocational education benefit society to any significant degree by providing jobs for teachers, administrators, and other vocational staff?

145. Outcome Question: Does the ongoing existence of vocational programs lead to an equitable distribution of the nation's income with earnings based on worker productivity?

146. Outcome Question: Does the establishment of a vocational education system cause new risk capital to be attracted to the state, thereby strengthening the local economy?

147. Outcome Question: Has the ongoing existence of vocational programs within local communities been a major factor in bringing new industries to the area?

148. Outcome Question: Has one of the major impacts of vocational education been the rationalization of human resources, thereby contributing to the rise in general standards of living?

149. Outcome Question: Does the ongoing existence of a vocational program free business and industrial resources by supplying trained employees at less cost than that of business and industry in training a work force?

150. Outcome Question: Does vocational education, through lack of planning, contribute to oversupply of manpower in some occupational areas and undersupply in others?

151. Outcome Question: Does the ongoing existence of a vocational education system significantly strengthen the manpower base of the local and state economy?

152. Outcome Question: Do vocational programs respond to and meet the emerging manpower needs at the local, state, and national levels?

153. Outcome Question: Does the establishment of vocational programs speed up industrial development at the local, regional, state, and national levels?

154. Outcome Question: Has the ongoing existence of vocational education improved the tradeoff between unemployment and inflation?

155. Outcome Question: When there is little need to train youth for employment, as in a depression, is the existence of vocational programs too costly and unproductive?

156. Outcome Question: Are vocational programs more costly than general/academic programs due to the use of expensive equipment and a lower student-teacher ratio?

B. OUTCOME QUESTIONS HAVING SOCIAL INSTITUTIONS OR SOCIETY-IN-GENERAL AS THE AFFECTED ENTITIES;

(2) RELATED PREDOMINANTLY TO THE NON-ECONOMIC SPHERE

157. Outcome Question: Has vocational education been an important factor in blurring the demarcation between socioeconomic classes, e.g., because it provides

individuals with skills enabling them to obtain jobs which, although they may be considered "working class," pay wages indistinguishable from those considered "middle class"?

158. Outcome Question: Have vocational programs continually reinforced the stratification of groups along social class lines?

159. Outcome Question: Has vocational education fostered curriculum differentiation resulting in ability grouping, testing, and guidance counseling, which in turn have fostered class segregation within the schools?

160. Outcome Question: Has vocational education fostered curriculum differentiation resulting in ability grouping, testing, and guidance counseling which in turn foster racial segregation within the schools?

161. Outcome Question: Do vocational programs reduce radical political activity in a society insofar as they tend to integrate new and/or alienated segments of the population into the established mainstream of the nation's socioeconomic life?

162. Outcome Question: Has one of the major impacts of vocational programs been the continuous reinforcement of class bias and prejudice among students in public education?

163. Outcome Question: Does establishment of vocational programs result in easing unemployment for the few but in shifting the burden of finding work to other, less fortunate, segments of the population?

164. Outcome Question: Has vocational education provided institutions and citizens with an awareness of, information about, and an understanding of the implications of poverty conditions within the community, both socioeconomic and political?

165. Outcome Question: Does the establishment of a vocational program result in a heightended awareness within the community of the importance of developing human resources?

166. Outcome Question: Has vocational education created increased support for general quality education within communities because of the useful social services

it supplies such as providing needed manpower, inculcating acceptable social norms and values, and creating new job opportunities?

167. Outcome Question: Has vocational education been successful in involving community leaders in education through its use of citizen advisory committees?

168. Outcome Question: Does vocational education support and reinforce the social, economic, and political status quo?

169. Outcome Question: Has one of the major impacts of vocational programs been to reorient education toward vocational ends?

170. Outcome Question: Has vocational education contributed to the upgrading of teaching skills through its use of inservice training for vocational teachers?

171. Outcome Question: Does the establishment of vocational-technical schools and community collegs provide more types of adult education to the community?

172. Outcome Question: Does the establishment of a vocational-technical college system result in an expansion of the secondary vocational education system?

173. Outcome Question: Is vocational education, through cooperation with CETA, trade unions, business, industry, and the military, effecting institutional changes in educational delivery systems?

174. Outcome Question: Have the innovative teaching methods in vocational education influenced educational practices in general, e.g., the establishment of open-entry and open-exit programs, grouped ability classes, etc.?

175. Outcome Question: Does the separation characteristic of the relations between vocational and non-vocational or academic students in training carry over to the relations in their teaching careers, thereby severely hindering communication and cooperation between vocational and general/academic programs?

176. Outcome Question: Has vocational education been an important factor in promoting geographic mobility within society by providing skills needed throughout the nation in such areas as computer programming, welding, and secretarial services?

177. Outcome Question: Does participation in vocational programs effectively deter juvenile delinquency insofar as it requires youths to remain under supervised instruction during the day while inculcating a respect for the legal system?

178. Outcome Question: Does participation in the Home Economics curriculum of vocational programs result in actual benefits to home and to society as students receive childcare training?

179. Outcome Question: Does the ongoing existence of vocational programs strengthen the potential for national defense?

C. OUTCOME QUESTIONS HAVING SPECIAL NEEDS SUBPOPULATIONS (OR MEMBERS THEREOF) AS THE AFFECTED ENTITY;

(1) RELATED DIRECTLY TO ECONOMIC OR OCCUPATIONAL ROLES

180. Outcome Question: Does participation in a vocational program by mature and older workers of both sexes result in the acquisition of skills they need to become competitive in the labor force?

181. Outcome Question: Have many members of special needs sub-populations (racial, ethnic, linguistic minorities, the disadvantaged, etc.) been shunted by vocational education from a track leading to post-secondary educational opportunities onto a track leading to dead-end, low-pay, low-status jobs?

182. Outcome Question: Does participation in vocational programs by many special needs groups help them to become economically independent, thereby reducing the costs to society of institutionalization and/or providing for subsistence?

183. Outcome Question: Does participation in vocational programs increase the earnings of those persons whose hourly wage for full-time employment falls below the federal minimum-wage rate?

184. Outcome Question: Does participation in cooperative programs in vocational education significantly supplement the incomes of disadvantaged youths?

185. Outcome Question: Does participation in vocational training by the educationally and economically disadvantaged tend to reduce structural unemployment?

186. Outcome Question: Does vocational education promote the integration of the educationally and economically disadvantaged into society's occupational structure?

187. Outcome Question: Does establishment of vocational programs promote the development of business ownership by Blacks?

188. Outcome Question: Does participation in vocational programs in large cities and in de facto segregated school systems cause Blacks and other minorities to receive training in areas requiring lower skills than in those areas of training provided by predominantly white schools?

189. Outcome Question: Do many vocational educators impose training in manual skills on Blacks and other minorities by establishing the curriculum so that no other choice or alternative is available?

190. Outcome Question: As a result of the stringent entrance requirements imposed by many vocational programs, are Blacks and other minorities sometimes excluded from vocational programs?

191. Outcome Question: Has participation of Blacks and other minority groups in vocational training been obstructed because the modern facilities are located in suburbs, outside of urban areas having a high concentration of non-white population?

192. Outcome Question: Does participation of Blacks in vocational programs limit their training to areas of traditonally "Negro" employment, e.g., occupations where Blacks provide services to other Blacks (as in barbering).

193. Outcome Question: Does vocational education contribute to the increased representation of minorities among the leaders in the business community?

194. Outcome Question: Has vocational education promoted opportunities for Blacks and other minorities to enter high paying occupations?

195. Outcome Question: Does the existence of vocational programs in high schools foster a dual system of education by tracking lower-class, minority boys into low status programs and in tracking lower-class, minority girls into occupations traditionally female on the one hand and on the other, by tracking middle- and upper-class students of both sexes into academic programs?

196. Outcome Question: Do sex-stereotyping biases of vocational educators and counselors limit women and girls to training for only a narrow range of occupations?

197. Outcome Question: Has participation in vocational programs enabled many women to overcome their early socialization and to obtain skills that qualify them for work in non-traditional occupations?

198. Outcome Question: Does participation in a vocational program prepare the displaced homemaker to become economically and psychologically self-sufficient, free from dependence on federal and state financial-assistance programs?

199. Outcome Question: Do the childcare facilities provided by many adult vocational programs allow women formerly unable to afford training to acquire skills which enable them to earn good salaries?

200. Outcome Question: Are vocational education programs likely to be successfully or unsuccessful with regard to program completion and/or job placement of the mentally retarded?

201. Outcome Question: As a result of the curricula found in prisons, is the vocational training received by female offenders generally limited to the areas of cosmetology and business?

202. Outcome Question: Are the vocational facilities in prison so obsolescent, in such poor condition, and of such poor quality that inmates cannot receive adequate training to prepare for post-prison employment?

203. Outcome Question: By participation in prison vocational programs do inmates acquire skills and work experience only in a narrow occupational area or in an area relevant only to prison maintenance?

204. Outcome Question: Have vocational programs in prisons led to an increase in the incidence of employment of offenders?

205. Outcome Question: Does participation in vocational programs teach Native Americans on small reservations useful techniques for marketing their handicrafts and wares of reasonable financial profits?

206. Outcome Question: To meet the needs of special groups, have vocational programs attempted to adapt the instructural material and facilities used in training regular students to make them effective in training the physically, emotionally, and mentally handicapped?

207. Outcome Question: In their attempts to meet the needs of special groups, have vocational programs organized their curricula so that program options offered regular students are also offered to physically handicapped students?

208. Outcome Question: Has the existence of vocational programs increased the participation of women in the labor force?

C. OUTCOME QUESTIONS HAVING SPECIAL NEEDS SUBPOPULATIONS (OR MEMBERS THEREOF) THE AFFECTED ENTITY;

(2) RELATED PREDOMINANTLY TO NON-ECONOMIC ROLES

209. Outcome Question: As a result of participation in vocational programs, do minority group students develop greater capability to assimilate and to adapt to general cultural patterns than similar groups participating in general/academic programs?

210. Outcome Question: Has vocational education been effective in providing access to programs in general and in developing specific types of programs that help equalize the life chances of students with special needs?

211. Outcome Question: Does the ongoing existence of a vocational education system significantly contribute to the equality of educational opportunities for Blacks and other minority groups?

212. Outcome Question: Where peer counselors and instructors have been recruited in vocational programs, have

individuals deficient in motivation and self-image improved in these aspects?

213. Outcome Question: Is the success of minorities in vocational programs often undermined by discriminatory, negative attitudes on the part of vocational educators and counselors?

214. Outcome Question: Do those who differ culturally and linguistically from the main culture experience serious learning and psychological difficulties during training when vocational educators and counselors exhibit insensitivity to these differences?

215. Outcome Question: Are minority students who compare unfavorably with their peers as a result of inappropriate testing often relegated to upgraded vocational centers or special education when with proper testing and counseling, they could progress favorably with their peer group?

216. Outcome Question: Do tests in vocational programs reflecting Caucasian standards and cultures cause minority students (especially those of a linguistic minority) to score unfavorable without reflecting the actual native ability of those tested?

217. Outcome Question: Do many handicapped and/or disadvantaged students who have displayed various antisocial behaviors become less disruptive in the classroom as a result of their participation in vocational courses?

218. Outcome Question: Do disadvantaged youths from a "welfare-ethnic" oriented home life acquire motivations and attitudes associated with a "work-ethic" culture due to their participation in vocational programs?

219. Outcome Question: Has vocational education aroused deep resentment among many Blacks who consider available programs poor in quality and organized to prepare Black youth for traditionally "Negro" jobs?

220. Outcome question: Do vocational programs that train members of special needs groups fail to teach these students how to deal effectively with the social pressures to be confronted in the work world (discrimination, rejection, etc.)?

221. Outcome Question: Do teachers, counselors, and administrators who tend to think in terms of "men's trades" and "women's trades" transfer these perceptions to vocational students?

222. Outcome Question: Does segregation of sexes in vocational programs tend to perpetuate existing conditions of sex inequity with sex-role stereotyping?

223. Outcome Question: When vocational programs place the mentally handicapped and the disadvantaged in the same courses, do the disadvantaged students resent sharing classes with the mentally retarded?

224. Outcome Question: Are extracurricular activities associated with vocational programs, e.g., youth organizations, organized to allow full participation by physically handicapped students?

225. Outcome Question: Does participation in vocational courses foster deculturalization of Native Americans?

226. Outcome Question: Does vocational education increase the quantity and quality of political skills, e.g., gathering information to support legislation, lobbying, voting, etc., among those who are concerned with programs for special groups.

227. Outcome Question: Is it the case that because in most states certification for teaching vocational courses requires only a minimum number of hours of instruction (usually gained while the individual is already teaching vocational courses), many teachers are not qualified to meet the unique problems of teaching disadvantaged and handicapped students?

228. Outcome Question: Is the term "disadvantaged" applied by some administrators in such a way that it becomes all-encompassing, thereby overlooking the needs of the actual disadvantaged population?

INDEX OF SPECIFIC TOPICS

The outcome questions in the compendium (Section II) have been numbered for identification sequentially beginning with #1 and extending to #228. Although it is hoped that most of the major topics relevant to vocational education are included in the index, it is not exhaustive with regard to the possible topics that could have been included. Lastly, topics have been cross-referenced where it seemed advisable and/or appropriate. The major topic headings are arranged in alphabetical order, followed by the identification numbers preceding each outcome question in the compendium. For example, if the earnings of vocational students is the topic of interest, a reader would find "earnings" entered in the index in the following way:

Earnings, of vocational students, 38, 39, 40, 88, 89, 90, 91, 92, ...

The reader can then refer to the outcome questions having the identification numbers listed after the topic. We have not exhaustively listed every outcome question potentially related to a specific topic. In obvious cases this has been represented by a series of periods following the last identification number listed. For example, given the large number of questions dealing with "postsecondary" students, "postsecondary" has been entered as below:

Postsecondary education, vocational, 30, 31, 32, 33, 34, ...

The reader is encouraged to scan the list to insure that all outcome questions relevant to the topic of interest have been noticed.

In some cases our sample of outcome questions lacked an entry for topics that are of concern to individuals interested in vocational education. Whenever appropriate, we have included these topics in the index and referred the reader to outcome questions that could be formulated so as to be applicable to those topics. For example, we have no outcome questions that specifically addresses vocational students who are migrants. Nevertheless, "migrants" is a topic included in the index in the following manner:

Migrants, 209x, 213x, 214x, 215x, 216x, ...

Outcome question #209x asks "Does participation in vocational programs develop within students who belong to minority groups a greater capability to assimilate and to adapt to the general cultural patterns of the community . . . ." Although the question refers to minority students rather than to students who are migrants, it could serve as an hypothesis about migrant students as well. In this way we hope to generate some thought about possible outcomes that while not included in our list of outcome questions, may nevertheless be important.

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VOCATIONAL EDUCATION OUTCOMES
(Final Report on Year One of the R & D Project "Examining
Vocational Education Outcomes and Their Correlates")

Attachment "C"

EXAMINING VOCATIONAL EDUCATION OUTCOMES: PERSPECTIVE ON THE STATE OF THE ART

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EXAMINING VOCATIONAL EDUCATION OUTCOMES: PERSPECTIVE ON THE STATE OF THE ART[1]

I. INTRODUCTION

This paper deals with the theory and practice of vocational education outcomes evaluation, which is part of the broader field of educational evaluation. It is not intended as a review and synthesis paper or comprehensive state-of-the-art essay on vocational education evaluation but mainly as a contribution to the conceptual basis of outcomes analysis.

A. Purpose of the Essay

The overall purpose of the essay and the study to which it relates is to help answer the research question: What particular outcomes are appropriate for use as criteria to evaluate vocational education programs?

Special attention in this paper is focused on:

--clarifying the nature and meaning of vocational education outcomes;

--expanding awareness of the range and diversity of outcomes;

---

[1] This essay was prepared as part of The National Center's applied research and development project, "Examining Vocational Education Outcomes and Their Correlates," under a contract with the Bureau of Occupational and Adult Education, Office of Education, U. S. Department of Health, Education, and Welfare. Other products of this study include an annotated bibliography of vocational education outcome studies (Attachment "A" in the present report) and a thesaurus of vocational education outcome questions (Attachment "B" in the report). The essay was written by Robert L. Darcy, who wishes to express appreciation to John T. Grasso, Michael Scriven, Douglas Sjogren, and Daniel L. Stufflebeam for their review of an earlier draft. The author also acknowledges, with special thanks, the helpful comments and suggestions received from staff colleagues and members of The National Center's evaluation technical advisory panel.

- --developing an approach to outcomes evaluation within the general framework of vocational education evaluation;
- --identifying some issues, problems, and practices in the evaluation of vocational programs with respect to outcomes; and
- --suggesting an agenda for strengthening research and evaluation in the field of vocational education outcomes, which in turn can contribute to improving the effectiveness and efficiency of educational programs.

The present paper does not identify a blue-ribbon list of valid, operational outcomes nor does it lay out a procedure for doing so. Those tasks remain to be accomplished in the future.

The audience addressed by this paper includes educational researchers and evaluators, vocational education policy makers, academics, and the general public. While some of the ideas and information contained in this paper may be directly useful to practitioners, it is not intended as a how-to-do-it handbook for program managers, evaluators, or classroom teachers.[2]

B. Rationale for Studying Educational Outcomes

Outcomes analysis is important to observers of vocational education for at least three very practical reasons. First, the states are mandated by Congress to evaluate program effectiveness on the basis of two specific outcome criteria: (a) employment in training-related occupations, and (b) employer assessment of the training and preparation-for-employment received by students.[3] Many more outcomes, such as educational achievement and human development, are perceived by educators and others as being of immense importance both to individual students and society. Second, public concern over tax burdens, rising costs of government, and accountability regarding returns from educational spending have led to a search for tangible indicators of program impact. Third, as educational evaluation has developed and matured, study of the broad area of outcomes and impact has assumed increased importance in a comprehensive program of evaluative research alongside such non-outcome variables as institutional context, student characteristics, resources, program goals, and educational processes.

---

[2] To help meet the needs of practitioners, The National Center has developed Evaluation Handbook: Guidelines and Practices for Follow-Up Studies of Former Vocational Education Students (Stephen J. Franchak and Janet Weiskott, 1978). The annotated bibliography alluded to in footnote 1 above reports on design and procedures that have been used in some empirical outcome studies conducted during the past decade. Another Center project completed in 1978 is Interpreting Outcome Measures in Vocational Education: A Final Report (Floyd L. McKinney, Kenney E. Gray, and Marie Abram). Scheduled for publication by The National Center in 1979 are five state-of-the-art papers dealing with various aspects of evaluation: needs assessment, longitudinal methods, use of evaluative data, impact evaluation, and data sources for vocational education evaluation. In addition, the National Institute of Education is developing a series of background papers and evaluation studies on vocational education under a mandate included in the Education Amendments of 1976.

Moreover, these practical considerations are in keeping with the fundamental purposes of scientific inquiry: to discover (1) the consequences of given actions (including programs, policies, and institutional arrangements) and (2) the specific actions that will produce given consequences. In the policy sciences, there is a third function of research, namely to generate information which can help decision makers select the goals that will be treated as desirable "given" consequences and provide evaluators with standards to be used in evaluating observed consequences. In the present context, we are addressing conceptually, a question of "positive analysis"--What are the various possible consequences of vocational education programs? and a question of "normative analysis"--Which of these consequences are appropriate and feasible to be used as criteria for evaluating vocational programs?[4]

---

[3] Education Amendments of 1976, P. L. 94-482, Sec. 112(b).

[4] Nobel prize winner Milton Friedman quotes John Neville Keynes in distinguishing among "positive science," a systemized body of knowledge concerning what is; "normative science," knowledge addressing criteria of what ought to be; and "art," a system of rules for the attainment of a given end. Essays in Positive Economics (Chicago: University of Chicago Press, 1953), p. 3.

II. EDUCATIONAL EVALUATION AND OUTCOMES ANALYSIS

A review of literature in the broad area of evaluation, the narrower field of educational evaluation, and the more specialized field of vocational education evaluation discloses considerable variation in perceptions and preferences concerning the nature, purpose, and methods of assessment and evaluation.

A. Assessment, Evaluation and Research

In the Encyclopedia of Educational Evaluation, assessment is defined as "the process of gathering data and fashioning them into an interpretable form."[5] Worthen and Sanders in Educational Evaluation: Theory and Practice, identify five "schools of thought about how evaluation ought to be defined." As practiced by their respective adherents, these approaches are characterized as: (1) "educational measurement," (2) "professional judgment," (3) "comparing performance data with clearly specified objectives," (4) "collecting information to assist decision-makers in choosing among available decision alternatives," and (5) "systematic collection and analysis of information to determine the worth of a thing." Irrespective of approach, description is acknowledged to be a basic component of the evaluation process.[6] Evaluation is sometimes referred to as evaluative (or evaluation) research. Scriven suggests that "the basic distinction [between 'straight' research and evaluation research] seems to be that evaluation research must produce as a conclusion exactly the kind of statement that social scientists have for years been taught is illegitimate: a judgment of value, worth, or merit."[7] In the present paper we are adopting the Worthen and Sanders/ Scriven definition of evaluation as the determination of the worth of a thing. In this view, evaluation involves (a) observation and description of what is, and (b) a value judgment concerning what should be, i.e., a judgment of merit or worth.

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[5] Sometimes the term "assessment" is used interchangeably with "evaluation" and with "measurement." See Scarvia B. Anderson and others, Encyclopedia of Educational Evaluation (San Francisco: Jossey-Bass, 1975) p. 27.

[6] Blaine R. Worthen and James R. Sanders, Educational Evaluation: Theory and Practice (Worthington, Ohio: Charles Jones, 1973), pp. 20f, 109f, 125. In their treatment of description as a component of formal evaluation, Worthen and Sanders focus on the ideas of Robert E. Stake. More recently, writing in the newsletter of The Evaluation Network, Joe B. Hansen emphasizes the importance of description in program evaluation and laments the bias which evaluators display for experimental studies to the neglect of full and accurate description. "With the advent of modern statistical techniques and the wide availability of computers to perform statistical analysis," he writes, "educational research and evaluation have become associated with statistical methodology to the point of eclipsing more fundamental considerations. It could be interpreted by practitioners of this emerging art-science as a sign of insecurity -- (footnote continued on next page)

However defined, evaluation has numerous purposes and methods. The former include accountability, compliance, project monitoring, program improvement, and providing useful information for judging decision alternatives such as whether to continue, expand, modify, or terminate programs.[8] Needs assessments are conducted, and both formative and summative evaluations are carried out. The diversity of evaluation methods is suggested by some of the terms one encounters in the literature: goal-based evaluation, goal-free evaluation, formal, informal, objective, subjective, process, on-site, product, follow-up, impact, payoff evaluation, benefit-cost studies, cost-effectiveness analyses, and the sometimes ambiguous "program" evaluation.

This kaleidescope of concepts, purposes, perceptions, and procedures adds a richness to evaluation that may, however, exact a toll. The other side of the diversity coin in educational evaluation is a lack of consistency, clarity, and

---

[6] (continued) -- that evaluators are often more concerned with the statistical significance of their results than with the importance of the questions to which the analyses are addressed." See "The Formative-Summative Dichotomy and the Role of Description in Program Evaluation," Evaluation News, No. 6, August 1978, pp. 14-16.

[7] Michael Scriven, "Evaluation Perspectives and Procedures," pp. 3-93 in W. James Popham (ed.) Evaluation in Education (Berkeley: McCutchan, 1974), p. 4.

[8] In Educational Evaluation and Decision Making (Itasca, Ill.: Peacock, 1971), prepared for the education society Phi Delta Kappa by Daniel L. Stufflebeam and others, evaluation is defined as "the process of delineating, obtaining, and providing useful information for judging decision alternatives."

credibility with respect to the knowledge base we have accumulated in the field of educational outcomes.[9]

B. The Education Enterprise and Educational Evaluation

It will be helpful to view educational outcomes and outcomes evaluation in the broader framework of the overall education enterprise.

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[9] A 1976 report by the Committee on Vocational Education Research and Development (COVERD) noted that "$250 million spent by the U. S. Office of Education in vocational education research and development during the last 10 years has not had documented, widespread impact" (Assessing Vocational Education Research and Development, National Academy of Sciences, p. 1). Commenting on COVERD's findings, the president of the American Vocational Education Research Association observed that "the substance and process of vocational education research leaves something to be desired" (J. Robert Warmbrod, "Evaluation Research in Vocational Education," paper presented at the AVERA annual meeting in Houston, Texas, December 6, 1976, pp. 1, 6-11.) Other evaluators have noted that "most of . . . [the evaluation of investments in the human agent, such as vocational and technical education] is of little or no use for purposes of making reasoned choices among competing social programs . . . due to the methodological errors which mar many studies as well as the lack of effective techniques to handle many of the more difficult issues which arise as a part of the evaluative process (Jerome Moss, Jr., and Ernst W. Stromsdorfer, "Evaluating Vocational and Technical Education Programs" in Gerald G. Somers and J. Kenneth Little, Vocational Education: Today and Tomorrow, Center for Studies in Vocational and Technical Education, University of Wisconsin, 1971, p. 221). Floyd L. McKinney found "a lack of consistency in the use of acceptable procedures in conducting follow-up studies" (Program Evaluation in Vocational Education: A Review, ERIC Clearinghouse on Career Education, The Center for Vocational Education, Ohio State University, 1977, p. 24). Writing in an official U. S. Department of Labor magazine in 1974, a Columbia University researcher observed that "the large body of studies [analyzing] the outcomes of high school vocational education [are] beset with conceptual problems, methodological pitfalls, and statistical limitations . . . . Proceeding from different values and assumptions, the analysts have not even agreed on the objectives or outcomes to be tested" (Beatrice G. Reubens, "Vocational Education: Performance and Potential," Manpower, July 1974, pp. 23-29). For additional comments on the state of vocational education evaluation, see the Annotated Bibliography of Vocational Education Outcome Studies cited in footnote 1 above.

Figure 1 lists six components of the educational system, each of which may be seen as an appropriate object for description and evaluation. These interdependent sets of education variables are:

(1) Context -- the milieu of circumstances and needs, organizational arrangements, societal values, institutional settings, and the physical environment within which education takes place;

(2) Students -- characteristics of the potential learners, who are recipients of investment activities and whose human capital[10] will be enhanced when the investment activities are successfully carried out;

(3) Resources -- in money terms, the funds allocated to pay for real resources employed in educational production; in real terms, the quality and quantity of human and physical factors of production so employed (e.g., teachers, physical plant, instructional supplies and equipment);

(4) Goals -- the stated or unstated aims of educational programs (i.e., intended educational outcomes); and

(5) Processes -- instructional methods, program procedures, and educational technologies (broadly defined);

(6) Outcomes -- short-term consequences and longer-term impact resulting from vocational programs (i.e., dependent variables associated with the interaction of the five preceding sets of independent variables).

This six-factor analytical framework is similar to the CIPP model (Context, Input, Process, Product) described in evaluation literature, although the terms are not defined in

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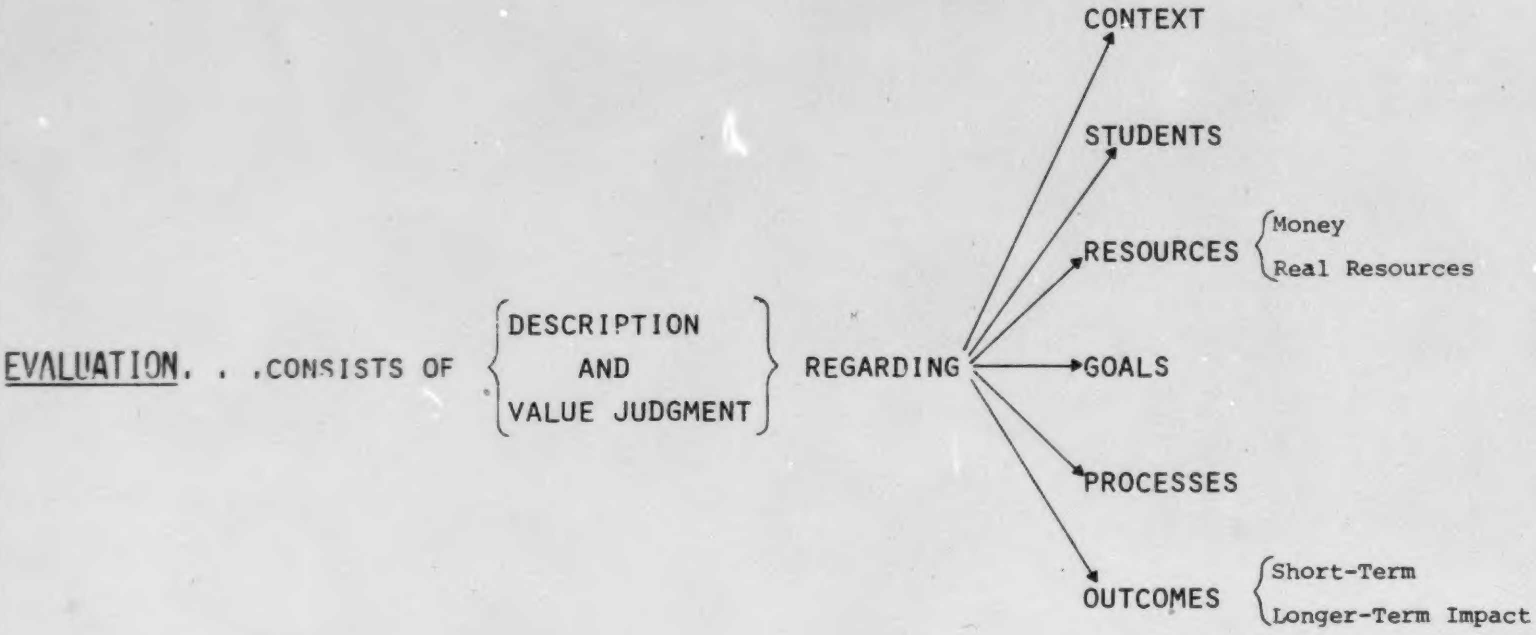
[10] Acquired capabilities that can be used in one's capacity as a factor of production, i.e., as a human resource. See Robert L. Darcy, "The Nature of Economic Enterprise," in Edwin L. Herr (ed.) Vocational Guidance and Human Development (Boston: Houghton MIfflin, 1974), p. 121. Note that human capital does not denote people, but capabilities embodied in people. For a simplified explanation of human capital investment, see William E. Becker, Jr., "Investment in Human Capital," pp. 59-76 in Warren G. Meyer (ed.) Vocational Education and the Nation's Economy (Washington, D. C.: American Vocational Association, 1977).

COMPONENTS OF THE EDUCATIONAL ENTERPRISE

AND

TYPES OF EDUCATIONAL EVALUATION

(IN TERMS OF WHAT IS BEING EVALUATED)



EVALUATION. . .CONSISTS OF {DESCRIPTION AND VALUE JUDGMENT} REGARDING

- CONTEXT
- STUDENTS
- RESOURCES {Money, Real Resources}
- GOALS
- PROCESSES
- OUTCOMES {Short-Term, Longer-Term Impact}

RLD/11-78

Figure 1

precisely the same way.[11] It also resembles a conventional education production function, which relates input factors to educational products or outputs.[12] The five "input" factors listed in Figure 1, which interact to constitute educational programs or "treatments," are recast in Figure 2 (note input factors $n_1 \ldots n_5$) in the format of a production function. This analogy suggests that over a period of time, and subject to the influence of intervening forces and error factors, it is theoretically possible to observe certain outcomes as having been generated by (i.e., significantly associated with) given educational treatments.

As suggested above, each component of the educational enterprise represents a potential object of systematic inquiry and evaluation. Description and assessment may single out for particular scrutiny, student characteristics (e.g., age, sex, mental ability, socioeconomic background of vocational students); or the quality of resources employed (e.g., training and experience of teachers); or educational outcomes (e.g., skill proficiency, employment status, hourly earnings) rather than addressing, under the rubric of "program evaluation," the totality of factors relevant to educational performance. Indeed, this selective, "partial equilibrium" methodology, based on the principles of specialization and division of labor, might produce the same results for vocational education evaluation that are claimed in economics: sharply increased productivity. We need to know far more than we presently know about student characteristics, context, resources, goals, and the processes of vocational education, as well as about outcomes. And certainly we need to know about correlations and interactions among the variables. The appeal for special attention to particular facets of the vocational education enterprise is not meant to imply that each component stands in isolation from the others. In education, as in the economic world, everything depends on everything else. Yet, it can still be fruitful to study parts and facets.

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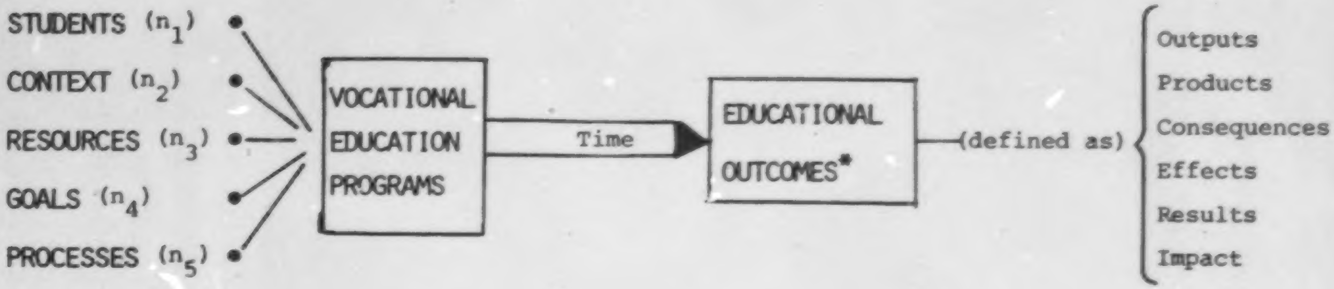
[11] See Daniel L. Stufflebeam, pp. 128-150 in Worthen and Sanders, Educational Evaluation: Theory and Practice.

[12] See Richard V. Kauffman, A Study of the Educational Production Function, Ph.D. thesis, Department of Economics, Colorado State University, 1974, pp. 24-31 (reprinted in hard copy by University Microfilms, Ann Arbor, 1978); and Daniel C. Rogers and Hirsch S. Ruchlin, Economics and Education: Principles and Applications (New York: Free Press, 1971), pp. 107f, 119ff.

THE EDUCATIONAL PRODUCTION FUNCTION AS A FRAMEWORK FOR EVALUATION

$$O=f(S,C,R,G,P)^*$$

Outcomes are a function of Students, Context, Resources, Goals, Processes



*Observed outcomes are subject to the influence of extraneous forces and error factors.

RLD/12-78

Figure 2

C. Vocational Education Outcomes

The focus of this essay, however, is on vocational education outcomes, which are broadly defined as the consequences of vocational programs.[13] Figure 3 illustrates the range and diversity of possible outcomes associated with vocational education programs. All outputs, products, consequences, effects, results, and impact of vocational programs are recognized as outcomes whether they are intended or unintended, positive or negative, short-term or long-term, economic or noneconomic, direct or indirect. These outcomes may affect individual students, society as a whole, particular societal entities (such as the local school system), or functional characteristics such as the human resource base of the state and local economy. The outcomes may be seen as resulting from a student's participation in vocational education or from the existence of ongoing programs in the community. Outcomes are manifest as changes in individual or societal capabilities (including knowledge and skills), attitudes, attributes, status, or circumstances.[14]

Some outcomes, such as the acquisition of occupational skills by secondary school students who complete vocational programs, are objectively observable and readily quantifiable. Others, such as the development of work-related attitudes or leadership capability, may be perceived more subjectively while defying straight-forward empirical observation. Ease of measurement does not qualify a particular outcome as necessarily important or valid as a criterion for evaluating vocational education, though it certainly may offer practical advantages for such purposes.

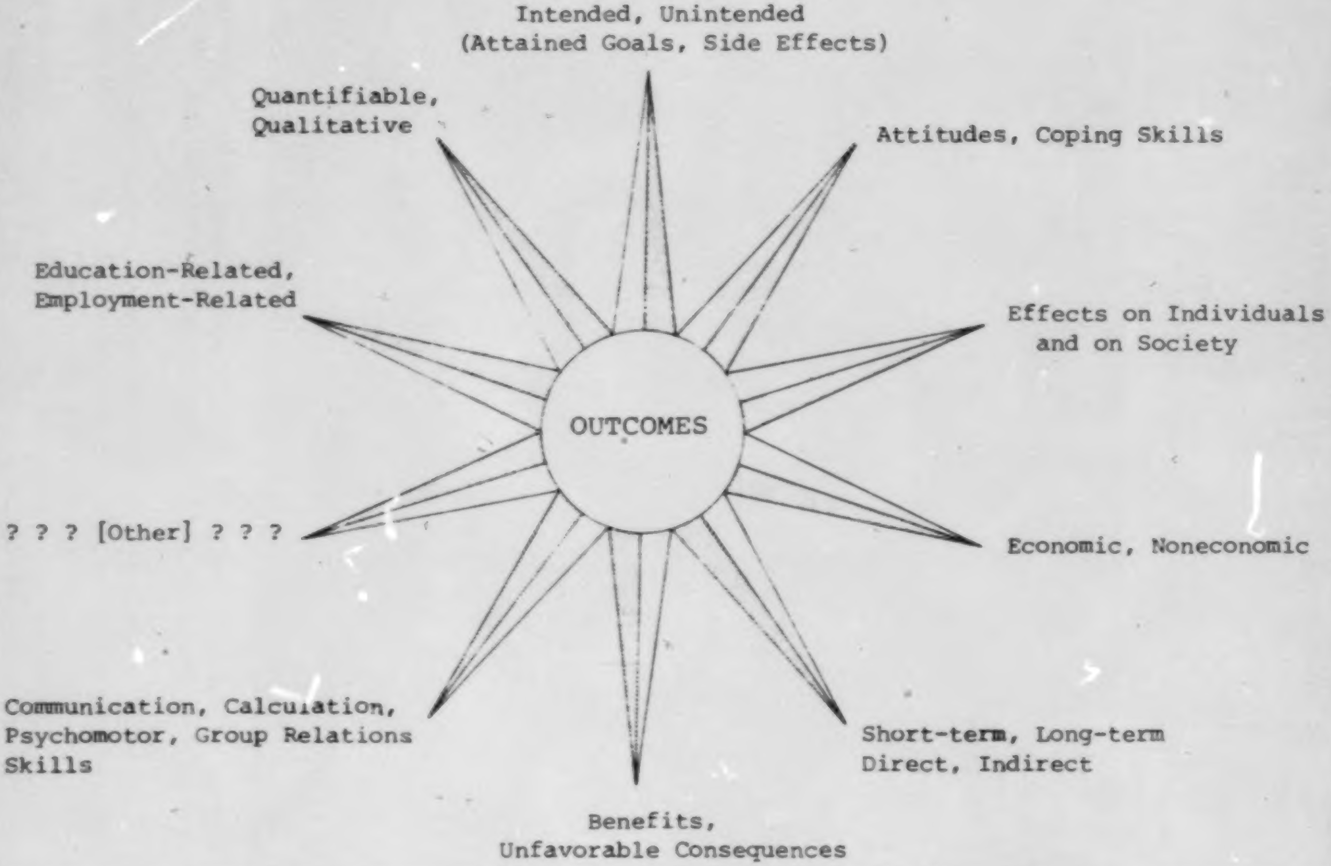
Figure 3 does not purport to identify all the kinds and characteristics of educational outcomes. No explicit reference, for example, is made to physical, esthetic, or moral development. The representation is suggestive and impressionistic, hence the question marks. Every effect that is

---

[13] Definitions of vocational education and vocational programs are presented in Section III below.

[14] A distinction is sometimes made between educational outputs and outcomes, the latter implying change while the former merely suggests "through-put." No attempt is made in this paper to distinguish among such terms as educational product, output, outcome, impact, etc. As indicated in Figure 3, outcomes are broadly defined to include all of the consequences and results of the education enterprise.

AN ILLUSTRATION OF SOME OF THE DIVERSE TYPES AND CHARACTERISTICS OF VOCATIONAL EDUCATION OUTCOMES


Intended, Unintended
(Attained Goals, Side Effects)
Attitudes, Coping Skills
Effects on Individuals and on Society
Economic, Noneconomic
Short-term, Long-term
Direct, Indirect
Benefits,
Unfavorable Consequences
Communication, Calculation, Psychomotor, Group Relations Skills
? ? ? [Other] ? ? ?
Education-Related, Employment-Related
Quantifiable, Qualitative
OUTCOMES

RLD/12-78

Figure 3

significantly linked with a vocational program is regarded as a vocational education outcome. Informal observation, social criticism, and educational research have made the American people keenly aware of how much we do not know about the effects of schooling. We therefore need to speak of possible outcomes of vocational programs without confining the analysis to such narrow outcome sets as pre-announced goals, presumed benefits, or quantitatively measured impact.

Outcomes typically are multidimensional--e.g., a mixture of educational and economic consequences, cognitive and affective, individual and societal--and they occur as "joint products" in the sense of multiple outputs occurring together in a single production process. Thus, just as lumber and wood particles are simultaneous outputs of the logging industry, so too are occupational skills, job-related attitudes, and a high school diploma--all "products" resulting from the same schooling experience. Which is the "product" and which the "byproduct" is a matter of selective perception. A comprehensive assessment of vocational education outcomes would acknowledge all of the observable consequences and presumably focus on the ones which are of special relevance to the evaluation task at hand. It would also recognize the opportunity costs or tradeoffs associated with vocational programs, i.e., the alternative educational outcomes foregone because the resources are being utilized in vocational programs.

Differential outcomes may be associated with variations in educational treatment (see Section III below), intensity of treatment, i.e., "time on topic"), educational level (high school, post-secondary, adult), student characteristics (age, sex, race/ethnicity, socioeconomic background, physical or mental handicap, aptitudes, career interests, etc.) and a host of other variables indicated in Figures 1 and 2 above. This follows from the recognition that variation in the "input" factors of the educational production function (Figure 2 above) predictably will result in differential outcomes.

Awareness of the broad range, diversity, and multidimensional nature of possible educational outcomes is important to practitioners, researchers, evaluators, policy makers, and the general public. It helps offset the narrow perception of equating outcomes simply with goals or benefits, while ignoring "side effects." This expanded view in turn triggers a search for evaluative standards beyond preannounced program objectives and can stimulate a re-examination of program implementation strategies and overall policy.[15]

As an example, when state and local units of government first enacted general sales taxes, their single purpose was to raise revenue. Attention was focused on the outcome of fiscal productivity. Another outcome of the tax, however, was its regressive burden: low-income consumers paid higher effective tax rates (tax payments as a percentage of income) than high-income consumers. While the purpose of the tax was not to redistribute income, that was nevertheless an outcome. Awareness of this consequence eventually led many states to amend the general sales tax by exempting food, thereby reducing the regressivity of the tax.

Similarly, if an important outcome of vocational education is to increase the rate of school completion even though the stated objective (or specified evaluation criterion) is job placement, then knowledge of the school-completion outcome can be useful to policy makers as they revise legislation and allocate resources for the support of various programs. "Side effects" are consequences no less than attained objectives. As the environmental and consumer protection fields illustrate, yesterday's side effect may be tomorrow's most significant outcome.

Table I lists 30 questions concerning possible outcomes of vocational education. The outcome questions (verbal ex-

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[15] In a recent monograph on noneconomic outcomes, the U. S. Department of Labor noted the "unfortunate tendency to evaluate many employment and training programs in terms of narrow economic, cost-benefit analyses alone." The Job Corps was cited as "a good example of a program that should not be viewed so narrowly--a program in which the noneconomic impacts are at least as important and possibly more so, than economic benefits such as higher earnings." The report identifies 21 different noneconomic outcomes in three areas: (1) job related; (2) social-attitudinal; and (3) health-related. The outcomes are discussed in the context of "social development objectives . . . rehabilitation goals, and . . . remediation." U. S. Department of Labor, The Noneconomic Impacts of the Job Corps, R & D Monograph 64, Employment and Training Administration (Washington, D.C.: U. S. Government Printing Office, 1978), pp. iii-iv. Attachment "B" of the present report identifies a wide range of economic and noneconomic outcomes and discusses the various uses that can be made of a comprehensive list of outcome questions or hypotheses.

Table I

POSSIBLE OUTCOMES OF VOCATIONAL EDUCATION: ILLUSTRATION OF THE RANGE AND DIVERSITY OF POSSIBLE OUTCOMES

No.	Outcome Questions	Thematic Area
1.	Do students become occupationally proficient and ready for entry-level employment as a result of completing a vocational program?	Skill acquisition
2.	What proportion of former vocational students are employed in training-related jobs six months following program completion?	Employment in training-related jobs
3.	Are dropout rates lower for vocational students than for comparable students enrolled in general/academic curricula at the secondary school level?	Schooling
4.	Do vocational programs at all levels--high school, postsecondary, and adult--significantly strengthen the human resource base of the local and state economy?	Economic development
5.	One year following program completion, are former vocational students earning higher hourly wages than comparable, general/academic students in similar jobs?	Wage rates
6.	Are the parents of students who are enrolled in vocational programs better satisfied with the overall high school program than parents of students enrolled in general/academic curricula?	Parental satisfaction with school program
7.	Do vocational students obtain jobs which they consider acceptable, whether in training-related fields or not, within a specified time period following program completion?	Employment
8.	Are vocational programs more effective or less effective than general/academic curricula in enhancing the self-image and self-confidence of students who are preparing for employment?	Student self-image

continued ⟶

Table I (Continued)

POSSIBLE OUTCOMES OF VOCATIONAL EDUCATION:
ILLUSTRATION OF THE RANGE AND DIVERSITY OF POSSIBLE OUTCOMES

No.	Outcome Questions	Thematic Area
9.	Do vocational students receive higher employer ratings than comparable general/academic students following a specified period of employment?	Employer assessment of students
10.	Do vocational students develop leadership ability through their participation in occupationally-related youth programs such as Distributive Education Clubs of America (DECA), Future Homemakers of America (FHA), Future Farmers of America (FFA), and Vocational Industrial Clubs of America (VICA)?	Leadership development
11.	Are students who are currently enrolled in vocational programs better satisfied with their overall school experience than comparable students enrolled in general/academic curricula?	Student satisfaction with schooling
12.	Do graduates of vocational programs express more, less, or the same job satisfaction as comparable graduates of general/academic programs holding similar jobs?	Job satisfaction
13.	Does participation in high school vocational programs reduce the incidence of school vandalism and other antisocial behavior on the part of students?	Antisocial behavior
14.	Does vocational education (high school, postsecondary, adult) provide its graduates with a general set of skills and basic work disciplines that significantly increase their chances for successful employment?	Employability development

continued ⟶

Table I (Continued)

POSSIBLE OUTCOMES OF VOCATIONAL EDUCATION:
ILLUSTRATION OF THE RANGE AND DIVERSITY OF POSSIBLE OUTCOMES

No.	Outcome Questions	Thematic Area
15.	By completing a vocational program, do students acquire job-seeking skills such as how to write a resume, how to participate in an interview, and knowing where to look for job opportunities?	Job-search skills
16.	Do students enrolled in vocational programs learn the basic cognitive skills of speaking, reading, writing, and numerical calculation as effectively as comparable students in academic/general curricula?	Educational achievement
17.	Does participation in a vocational program give students a realistic understanding of what employers will expect of them on the job?	World-of-work understanding
18.	Is the occupational mobility of vocational students limited both horizontally and vertically by the content of the programs (e.g., training in narrow skill areas or in occupations with diminishing job opportunities)?	Occupational mobility
19.	Does participation in a high school vocational program inhibit or enhance a student's opportunities for a college education?	College education
20.	Do students who complete vocational programs have a more realistic understanding of our society and its economic system than comparable students who complete general/academic programs?	Socioeconomic understanding
21.	Are the returns from individual and social investments in vocational education lower, higher, or the same as returns from investments made in general/academic programs below the baccalaureate level?	Economic returns to schooling

continued→

Table I (Continued)

POSSIBLE OUTCOMES OF VOCATIONAL EDUCATION:
ILLSUTRATION OF THE RANGE AND DIVERSITY OF POSSIBLE OUTCOMES

No.	Outcome Questions	Thematic Area
22.	Does participation in vocational programs on the high school level contribute measurably to the moral development of students?	Moral development
23.	Through their participation in vocational education programs (e.g., cooperative education, placement in part-time jobs), do disadvantaged minority youth earn more income while still in school than comparable students in general/academic programs?	Student earnings
24.	Do high school, postsecondary, and adult vocational programs increase occupational awareness, training opportunities, and job access for women in both traditional and nontraditional areas?	Employment opportunities for women
25.	Does favorable community reaction to ongoing vocational programs result in general expressions of satisfaction and financial support for the entire local school system?	Community support for education
26.	Do students who have participated in vocational programs on the high school level have more clearly defined occupational goals than those expressed by nonvocational students who enroll for postsecondary education?	Career planning
27.	Do high school home economics courses significantly increase the consumer skills of students who have taken them?	Consumer skills

continued ⟶

Table I (Continued)

POSSIBLE OUTCOMES OF VOCATIONAL EDUCATION:
ILLUSTRATION OF THE RANGE AND DIVERSITY OF POSSIBLE OUTCOMES

No.	Outcome Questions	Thematic Area
28.	Do certain admissions and student assignment practices followed in vocational education tend to reduce or to reinforce occupational discrimination on the basis of race, class, or sex?	Occupational discrimination
29.	Is job-search time lower for students who participated in vocational programs, than for comparable workers who did not?	Unemployment
30.	How do the annual earnings of vocational graduates compare with those of general/academic graduates, both in the short term and in the long run?	Earnings

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on such topics as schooling, antisocial behavior, economic development, parental attitudes, and the like. Some of the questions imply positive consequences for vocational programs, while others may suggest negative or neutral effects. What is quite clear is that even a limited array of vocational education outcomes, as we have illustrated here, extends well beyond traditionally announced program objectives, labor market benefits to individual students, and alleged harmful or beneficial effects on educational development.

Several of the outcome questions in Table I have been addressed in empirical research and evaluation studies.[16] Undocumented assertions have been made regarding the facts alluded to in other questions. And some of the questions have simply been posed without conjecture as to the answers. At this point in the discussion, in keeping with our intent to expand awareness of the range and diversity of outcomes, we simply wish to regard these questions as illustrative verbal expressions of possible results: waves and ripples that vocational programs may or may not be generating.[17]

D. Outcomes and Outcome Statements

Figure 4 outlines a conceptual framework for evaluating educational outcomes. The outcomes themselves (Roman numeral I) are empirical phenomena: real-world consequences of educational programs. Outcome Statements (II) are verbal expressions of these cause-and-effect phenomena. Educational outcome statements can take the form of declarative sentences or hypotheses (as in Table I): "Completers of high school vocational programs have lower rates of unemployment six months after graduation than comparable completers of academic/general curricula." Or they can be phrased as questions: "Do completers of high school vocational programs have lower rates of unemployment six months after graduation than comparable completers of academic/general curricula?" An outcome statement describes what happens to whom and how, and in some cases also indicates when, where, and why. As a minimum, a meaningful outcome statement clearly identifies (1) an outcome, (2) the person or thing affected, and (3) the educational treatment. Often the statement (or outcome question) will also identify the agency through which the treatment is applied, a rationale for the posited outcome, and a time framework. Expressing an educational outcome in precise verbal form affords two important benefits: clarity of understanding and clarity of communication. As Roget of Thesaurus fame and others have pointed out, words are not only a medium of communication, but equally important, they are instruments of thought.[18]

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[16] For the identification of some of these hypotheses plus annotations of empirical studies, see Attachment "A" of this report.

[17] Attachment "B" lists 228 vocational education outcome questions, further illustrating the range and diversity of possible outcomes. The introduction to the thesaurus also discusses the content of outcome statements and the rationale for using a question format in listing outcome verbalizations.

In Table I, questions are used rather than statements or hypotheses. This is to avoid giving an impression that we are asserting beliefs or reporting documented facts.

Outcome Measures (Point III in Figure 4) are empirical indicators of the educational outcomes. These indicators may be quantitative (differences in amount, expressed numerically/statistically) or qualitative (differences in kind, described verbally). The outcome measures are empirical indicators of the changed conditions or circumstances resulting from an educational program. These changes may be observable directly or indirectly. The measures may be bare descriptive indicators or evaluative indicators. Outcome measures require empirical information such as employmentment and wage data, and standards or norms for evaluating the data. It is at point III-B in the framework, therefore, that positive analysis of educational outcomes (observation and description) merges with normative analysis (appraisal of data) to produce the judgment of worth that constitutes educational evaluation (IV).

The findings about program consequences (V) that result from evaluation research become available for a variety of applications including policy making, program improvement, accountability, and decisions to terminate, expand, or otherwise modify the education enterprise. Returning to

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[18] The author is indebted to Herbert A. Simon, winner of the 1978 Nobel Prize in Economics, for Roget's observation: "The use of language is not confined to its being the medium through which we communicate our ideas to one another; it fulfills a no less important function as an instrument of thought; not being merely its vehicle, but giving it wings for flight." Herbert A. Simon and Allen Newell, "Models: Their Uses and Limitations" in Leonard D. White (editor) The State of the Social Sciences (Chicago: University of Chicago Press, 1955), p. 66.

EDUCATIONAL OUTCOMES EVALUATION FRAMEWORK

(I) EDUCATIONAL OUTCOMES

(II) OUTCOME STATEMENTS/HYPOTHESES/QUESTIONS

(III) OUTCOME MEASURES (INDICATORS)

(III-A) EMPIRICAL DATA (QUALITY AND ACCESSIBILITY)

(III-B) STANDARDS FOR EVALUATING THE DATA
(Derived from various sources)

(IV) ANALYSIS, INTERPRETATION, AND EVALUATION

(V) FINDINGS CONCERNING THE CONSEQUENCES OF PARTICULAR PROGRAMS

(VI) APPLICATIONS OF FINDINGS ABOUT OUTCOMES

(VI-A) • POLICY (GOALS, RESOURCES, RESOURCE ALLOCATION)
(VI-B) • PROGRAM DESIGN
(VI-C) • PROGRAM MANAGEMENT
(VI-D) • ACCOUNTABILITY

III-B, we want to emphasize the point that introducing value criteria (standards of goodness or badness) into the research process is prerequisite for making evaluative judgments. Whether a particular outcome such as the placement of 65% of all vocational graduates in training-related jobs is considered good, bad, or indifferent depends on the evaluative standards applied. Knowledge of facts alone may be sufficient for research, but in the absence of a standard for comparison, there can be no meaningful evaluation.[19]

Standards or norms for evaluating observed outcomes can thus be regarded as the link between positive outcomes analysis and evaluation of outcomes, which by definition is a normative undertaking. Where these standards come from and how they are used are therefore fundamental issues to be considered in this paper.[20]

III. SOME KEY ISSUES IN VOCATIONAL EDUCATION OUTCOMES EVALUATION

As noted by the authors of a Rand Corporation report on the findings of educational research, "Education is an extremely complex and subtle phenomenon." Moreover, educational research is subject to serious limitations of data, measurement instruments, and experimental controls, including the influence of factors outside the schools ("perhaps strong enough to 'swamp' the effects of variations in educational practices"). The upshot is that "research has found nothing that consistently and unambiguously makes a difference in student outcomes."[21]

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[19] Jerome Moss, Jr., The Evaluation of Occupational Education Programs, Technical Report, Research Coordination Unit in Occupational Education, University of Minnesota, September 1968, p. 5.

[20] As suggested in Section I, outcomes analysis addresses two types of questions: What are the actual consequences of vocational education? and What are the desirable consequences of vocational education? The first is an empirical matter-of-fact question triggering a search for information about what is. The second is a normative question leading to a search for values indicating what ought to be. To the extent that value judgments are influenced by evidence and reason, the search for values and facts will be intertwined.

While the Rand assessment dealt with general education (and in the context of the federal government's role in school finance), the conclusions are not unlike those reported above for vocational education. Indeed, vocational education research and evaluation faces all of the general problems confronting education plus some special difficulties of its own, to which attention is now turned.

A. What is Vocational Education?

The study of educational outcomes, as illustrated in Figures 1 and 2 above, investigates the consequences of distinctive educational treatments or interventions. What is the nature of the treatment carrying the label "vocational education"?

According to the Education Amendments of 1976 (Sec. 195), the term vocational education means "organized educational programs which are directly related to the preparation of individuals for paid or unpaid employment, or for additional preparation for a career requiring other than a baccalaureate or advanced degree." In further defining an organized education program, the law refers to "instruction related to the occupation or occupations for which students are in training or instruction necessary for students to benefit from such training."

In a generic sense, vocational education can be defined as any program of education or training that enhances one's capability to pursue a vocation, i.e., a calling or occupation or career. Defined more narrowly for programmatic purposes, vocational education refers to occupational programs which are included in state plans developed by the respective State Boards for Vocational Education. A similar administrative definition limits vocational education to programs supported by Federal funds.[22] In practice, "the vocational education program has become so broad and diverse in its response to manpower demands and the needs of all ages and ethnic groups that it is almost impossible to describe in any definitive way."[23]

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[21] Harvey A. Averch and others, How Effective Is Schooling? A Critical Review and Synthesis of Research Findings, Rand Corporation, Santa Monica, Calif., March 1972. See pp. ixf., 154, 160. The authors emphasize that they are "not suggesting that nothing makes a difference, or that nothing 'works'; the problem is that research findings often conflict. In a conversation with the author of this paper, Michael Scriven pointed out, however, that cognitive outcomes do consistently show up. It is when educators "slide into grandiosity" searching for impact on life style, income distribution, and similar variables that planned variations in education seem not to work.

One may question whether it makes sense to speak of "the" vocational education program, not only because of the manpower demands and needs alluded to, but for at least two additional reasons. It has frequently been observed that there is no *national* vocational education program in the United States. We have 50 different state programs each with its own supposed needs, resources, goals, priorities, standards, definitions, data requirements, and delivery systems. In light of these differences, are there enough commonalities among state programs to discern a vocational education program that is reasonably "typical" for the nation? The answer would seem to be "Yes." Despite some interstate differences in Student characteristics (n_1 in Figure 2 above) and Context (n_2) it seems reasonable to this writer that nationally shared Goals (n_4) and the existence of national markets for Resources (n_3) and Processes (n_5) would combine to establish vocational education programs in the fifty states that are in essence quite similar. If this is in fact true, some important outcomes should be observable as a national pattern.

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[22] Vocational education is defined in *Encyclopedia Brittanica* as ". . . instruction that is intended to fit persons for industrial or commercial occupations" (Vol. 23, p. 95). The *Dictionary of Education* (edited by Carter V. Good) defines vocational education as "a program of education below college grade organized to prepare the learner for entrance into a particular chosen vocation or to upgrade employed workers; . . . training or retraining . . . is given in schools or classes under public supervision and control or under contract with a state board or local education agency" (p. 645). In Ohio State University's Proposal for a National Center for Research in Vocational Education, a distinction is noted between "Vocational Education (capitalized), the program supported under federal legislation; and vocational education in a generic sense . . . [which] embraces all activities, public and private, which are designed to contribute directly to occupational proficiency" (Vol. I, pp. 1f). Examples of such activities cited in the proposal include military training, Comprehensive Employment and Training Act (CETA) programs, public and private school vocational programs, and apprenticeships.

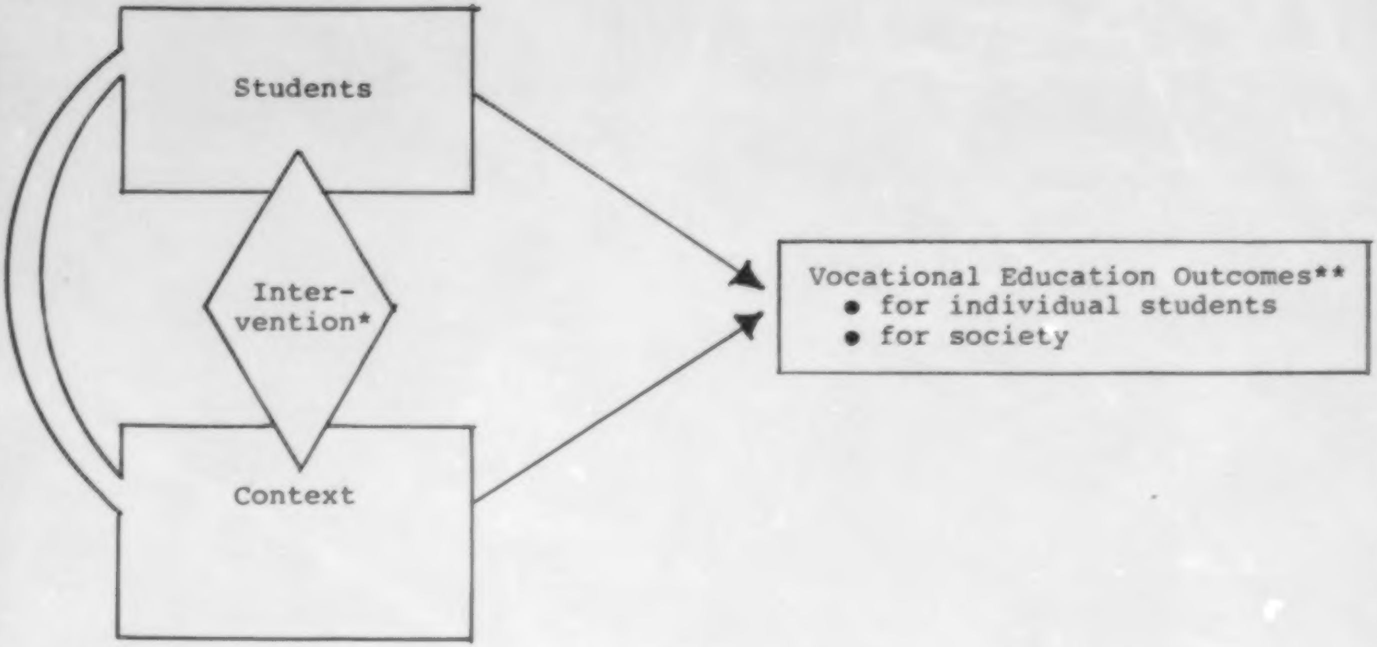
[23] Mary L. Ellis, *A Report to the Nation on Vocational Education* (College Park, Maryland: Ellis Associates, 1975), p. 2.

The other respect in which diversity might undermine the plausibility of treating vocational education as an entity relates to differences among particular occupational programs. Does Distributive Education, for example, have less in common with Vocational Agriculture than it does with the academic/general school curriculum? Are inter-program differences in goals, methods, personnel, and philosophy so vast that the occupational curricula share little other than the "vocational" label? Is it true, as some have claimed, that "There are no vocational educators, only Vo Ag, Home Ec, and T & I educators"? Operating on the premise that the more specialized and unique a program is, the easier it is to demonstrate differential outcomes, a case can be made for evaluating highly specific occupational curricula (such as Air Conditioning, Automotive Services, Diesel Mechanics) rather than clusters (such as Trade and Industrial Occupations). However promising this "component-program" approach to evaluation might appear, it would nevertheless pose methodological problems of its own when trying to aggregate results for the purpose of producing generalizations about "the outcomes of vocational education."

B. Vocational Programs as Educational Treatments

Answering the question, What is vocational education? is more than an "academic" exercise. If evaluation entails both description and appraisal as suggested in Section 2 above, a necessary first step for evaluation is to identify the entity to be described. What are the essential features of the distinctive educational treatment or intervention being evaluated? Figure 5 depicts the relationship between "input" variables and educational outcomes in a manner that differs somewhat from the production function of Figure 2. . Intervention (or program treatment) is defined in Figure 5 to include Resources (n_3), Goals (n_4), and Processes (n_5); while Students (n_1) and Context (n_2) are depicted separately. This formulation has the dual advantage of isolating the two "input" variables that are less amenable to variation while also highlighting the fact that outcomes may be observed with respect to either (a) individual students or (b) social context. The linkage on the left side of the schematic indicates continuous mutual interaction between Students and

DETERMINANTS OF VOCATIONAL EDUCATION OUTCOMES



*Intervention or educational treatment is narrowly defined here to encompass Resources (n_3), Goals (n_4), and Processes (n_5). (See Figure 2 above.)

**Observable effects of distinctive educational treatments (subject to the influence of extraneous forces and error factors).

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Figure 5

Context. Using this framework, we can build on the discussion of program definition in the preceding section.

The focus there was on interstate differences in vocational education programs and possibilities of disaggregation based on occupational clusters or specific program curricula. We now want to approach the unit-of-analysis issue from the broad perspective of the total educational program. The question may be posed: Is it appropriate for evaluation purposes to consider vocational education, however that elusive entity may be defined, as a treatment distinct from the total educational program (especially the occupational skills component)?

In discussing the issue of criterion variables for vocational education, one observer points to the "separation of vocational and general education" as a major source of difficulty. "As long as vocational education claims to be the sole input for the knowledge, skills, and attitudes required for occupational competence," he argues, "it will be vocational education, not the total school program, that takes the brunt of criticism that schools are not accomplishing satisfactorily their functions of occupational . . . preparation."[24] In other words, if outcome criteria such as occupational proficiency, employability, actual employment, work adjustment, "satisfactoriness" to employers, and a successful transition from school to work are to be used for evaluating program performance, should the treatment that is being evaluated be (a) the total school program, or (b) the subset of courses and experiences labeled vocational education?

Whether vocational education does indeed claim to be the sole source of the components of occupational competency--or has such a function ascribed to it--is a moot point. The practical question for vocational education evaluation is whether (a) or (b) is regarded as the treatment. If the former, then "evaluation of the school's occupational education function [for all of the school's students] becomes a complicated and methodologically sophisticated affair . . .

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[24] Warmbrod, "Evaluation Research in Vocational Education," pp. 8f.

something of the magnitude of the Coleman Report."[25] It might be conjectured that this strategy would also tend to remove the focused heat of educational accountability from vocational education.

Yet a legitimate question remains. So long as schools offer a course or set of courses and experiences under the rubric of vocational education--and with earmarked funding--there will be a reasonable expectation for an educational quid pro quo. What comes out of the vocational education process in response to the specialized resources that go into it? Perhaps the outcomes that can reasonably be expected will be much more limited than occupational competence, employability, employment, successful work adjustment, and the like. Some differential outcomes, however, should presumably be identifiable as the result of distinctive goals, processes, and resource utilization.

C. Evaluative Criteria, Experimental Controls, and Comparison Groups

According to one of the definitions listed in Section I, evaluation is the process of comparing performance data with clearly specified objectives. This conception of evaluation is associated with the currently popular view that the sole or dominant purpose of evaluation is program improvement: "Evaluation is not to prove, but to improve."[26] The approach helps explain why many people equate a study of vocational education outcomes with an investigation of goals and the extent to which they have or have not been achieved. Clearly, however, the observable effects of vocational programs may differ from the preannounced intent of such programs not only in terms of discrepancies between stated outcome goals and actual achievement, but also with regard to such side effects as (a) benefits not previously identified as goals and (b) other consequences that might be considered neutral or negative. In short, evaluation generically defined can serve other functions besides program improvement; and evaluative criteria can be derived from sources other than preannounced objectives.

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[25] Warmbrod argues (on p. 9 of his Beacon article) "When vocational education is viewed as a function of the total school program, some important issues relevant to the design and conduct of evaluation studies come into focus." First, the target population becomes all of the school's students, not just vocational students. Second, the treatments to be evaluated are various mixes of vocational and other courses. And third, "an evaluation of the school's occupational education goal becomes a part of the evaluation of all the goals and functions of the schools."

[26] Floyd L. McKinney, Program Evaluation in Vocational Education: A Review (Columbus: The ERIC Clearinghouse on Career Education, Center for Vocational Education, Ohio State University, 1977) p. 2.

It was noted in the Introduction that one function of research is to describe the consequences of given actions, such as the observable outcomes of particular educational programs. Positive outcomes analysis, as defined above, addresses the full range of educational outcomes, not just traditional objectives and presumed benefits. This breadth of scope can produce insights which in turn may generate new goals and priorities. In this way, knowledge of what is can contribute to informed judgments of what ought to be. If a stated objective of vocational education is preparation for employment in a training-related occupation but an observed and perhaps unanticipated outcome is employability in a much broader range of occupations, with corresponding labor market benefits for individual students, then the latter goal might appropriately be added to or substituted for the narrower one.

As we earlier emphasized, in moving from positive analysis to evaluation, there is a need for evaluative standards. Some of the standards may be goal-based; but lacking a comprehensive, omniscient statement of program objectives, where does the full set of evaluation standards come from?[27] One source is professional judgment as to what constitutes reasonable and appropriate performance. Agreement might be reached (by a panel of evaluators or their sponsors?) that an unemployment rate under 10% constitutes an acceptable programmatic outcome. Or a flexible norm could be established for vocational graduates pegged at say 75% of the unemployment rate for all labor force participants in the same age group.

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[27] It has been noted that an area "not well addressed in writings on the evaluation process is the establishment of standards and the relative utility of various types of standards (Quentin D. Clarkson and others, "A System for Establishing Evaluation Standards," CEDaR Quarterly, Vol. 10, No. 1, Spring 1977, pp. 17-19). In their proposed classification system, the authors distinguish four types of relative standards (Normative, Predicted, Control, Trend) and two types of absolute criteria (Arbitrary or intuitive, and Value-based). Moss and Stromsdorfer ("Evaluating Vocational and Technical Education Programs," p. 224) have observed that "the problem of evaluating vocational education is confounded by the fact that its objectives and outputs are multidimensional . . . [and] successful development, weighting, and estimation of performance indexes . . . has never been achieved."

Evaluative standards can be derived from observing the outcomes of similar program activities, e.g., job-search time required for CETA graduates to find unsubsidized jobs compared with job-search time for vocational school graduates, or differences in outcomes resulting from the same program observed over a period of years.

And, in certain instances, verbal absolutes such as "satisfactory," "high," "low," "good," "bad," can be posited as nonempirical standards. These seem less likely to prove useful and credible than criteria based on empirical observations (whether quantitative or qualitative).

Perhaps the most promising source of evaluation standards is needs assessment, which recognizes that someone's desiderata or "justified goals"--though not necessarily the sponsor's or producer's--are appropriate criteria for evaluating educational programs.[28]

Once again, definitional problems intrude on the issue of evaluative criteria. Who are "vocational students," and who are the "nonvocational students" with whom status or performance might usefully be compared? A host of related issues arise, including the use of experimental controls and comparison groups. Definitions aside, is it appropriate to compare employment status and earnings of former vocational students with nonvocational (i.e., academic and general) students? Should comparisons of labor market status and performance (e.g., finding employment in occupations related to training) only be made among specific occupational curricula within vocational education, or can such comparisons be made legitimately between the totality of vocational students on one hand versus all other students? If the latter, which particular entry-level jobs are "training-related" for graduates of the high school academic and general curricula?

Consider the mandate under the Education Amendments of 1976 to evaluate vocational programs "according to the extent to which program completers and leavers (a) find employment in occupations related to their training, and (b) are considered by their employers to be well-trained and prepared for employment." What are the procedural options for carrying out the evaluation? As an illustration, without extensive discussion, suppose the strategy is limited to identifying the former vocational students who have found training-related jobs (however defined) and then surveying their employers with given instruments. Assume that 60% of "program completers and leavers" found jobs in occupations related to their training and within this group, 80% were rated highly satisfactory with respect to their training and preparation for employment. How are the data to be evaluated? As noted in Section II, whether outcomes are considered good or bad depends on the comparison standards employed.[29]

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[28] Scriven, "Evaluation Perspectives and Procedures," p. 51.

It was suggested above that in the absence of clearly defined performance objectives or predetermined evaluation standards, it will be necessary to derive or develop such standards. One approach is to compare the status or performance of vocational students with another group, similar in all important respects--age, sex, mental ability, socioeconomic background, etc.--except that the vocational students received a distinctive educational treatment that was not provided to the comparison group. In the case of secondary school students, the comparison might be made for vocational students versus nonvocational (i.e., academic plus general) who are similar in all characteristics except the treatment variable (participation in a vocational program). Given such a comparison, is it reasonable to hypothesize significant differences in the outcome variable for the respective groups?

The general rationale for the hypothesis is that substantially different educational treatments can be expected to yield significantly different outcomes. Whether the differences between "vocational education" and the "regular treatment" can be expected to result in employability differences is a more specific and problematic question. Of the two outcome variables mentioned, placement in a training-related job is a highly questionable evaluation criterion for the following reasons: (a) "relatedness" is ambiguous; (b) vocational students who were enrolled in a particular curriculum may not desire employment in a related occupation (either because their preferred option was not offered and they simply took something that was available, or because the option they followed provided a useful opportunity to explore and reject a particular occupational field); (c) there are no appropriate comparison groups for whom differentiated fields of training can be identified; and (d) student access to particular jobs may have resulted more from personal contacts made by vocational teachers than from the possession of occupational skills.

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[29] It might be argued that interpretation and evaluation of the facts can be left to others--managers, policy makers, interested parties--who can furnish their own judgmental criteria. The question of who does the evaluating, however, does not diminish the importance of how it is done. Procedures and value premises will be of concern to all groups having a stake in the evaluation, and whoever supplies the values will presumably be held accountable. Dogmatic standards and vote-counting may seem expedient, but that leaves important value questions unanswered.

It might nevertheless be appropriate to enumerate the former nonvocational students in the same school class who found jobs (irrespective of occupational fields), draw a sample matched to the vocational students according to characteristics such as mental ability and socioeconomic background, and then compare employer assessments of vocational and nonvocational students relative to the extent to which they are considered "well-trained and prepared for employment."

A third enumeration could also be made--of vocational students who found employment in occupations outside their field of training--for comparison with the other two groups.

If the intent were to test the efficacy of the distinctive vocational education treatment with respect to employability (as measured by employer assessment of training and preparation), it would seem plausible to expect lower rates of unemployment for students exposed to an employment-related vocational education treatment as compared with students who were not.[30] If no significant differences occur

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[30] Such expectations are plausible for the same reason one would expect a student who completed three years of French to enjoy an advantage in the practice of that language over a comparable student who had spent three years taking history instead. A separate question relates to the amount of the differential in unemployment rates. Is achieving the differential worth whatever extra costs, if any, have been incurred in providing the vocational education program? Efficiency issues involving calculations of marginal benefits and marginal costs are not addressed in this paper, for two

(continued on next page)

between the matched groups, or if the regular group performed better than the treatment group, this certainly would not demonstrate that vocational education was an abysmal failure. It would suggest, however, that success criteria might be sought elsewhere; perhaps vocational programs do not enhance employability differentially but have other worthwhile outcomes. Alternative tests can presumably be designed to measure these outcomes, thereby helping to disclose the real nature of the vocational education outcomes function, i.e., the matrix of consequences associated with this distinctive educational treatment.

D. Nature and Quality of Outcome Data

Numerous studies have commented on the availability and interpretability of vocational education data. Evaluators have lamented the lack of national data, unambiguous data, accurate data, comparable data, "hard" data, cost data, and impact data.[31] Our own review of empirical outcome studies and

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[30] (continued) reasons. First, until we know more about gross outcome variables, it seems pointless if not pernicious to go through the exercise of manipulating the finely tuned pecuniary values needed to generate benefit-cost estimates. Second, there is so much methodological discretion inherent in performing benefit-cost, rate-of-return, and cost-effectiveness analyses that the findings may reflect the tastes and style of the investigator more faithfully than the nature of the empirical evidence.

[31] Among the data-related problems identified by McKinney, Gray, and Abram ("Interpreting Outcome Measures in Vocational Education: A Final Report," p. 1), are those of "definitions, communication, and problems of handling data." In the same report (Ch. III), Donald W. Drewes comments on data format and other issues associated with setting up the proposed Vocational Education Data System (VEDS). For additional perspective on data problems, see Arthur M. Lee "Project Baseline: Historiographic Foundations for Vocational Education Statistics," *Educational Researcher*, Vol. 6, No. 7 (July-August 1977), pp. 3-9. As indicated in footnote 2 above, two state-of-the-art papers dealing with vocational education data are scheduled for publication by The National Center in 1979. See Attachment "A" of the present report for comments on data used in some recent studies of vocational education outcomes.

related inquiries concerning the credibility and persuasiveness of outcome data suggest the need for a profile of data types classified on the basis of the nature of the data and how they are generated. Table II distinguishes five types of data used in describing and appraising the consequences of vocational education.

The literature review to which we allude disclosed heavier use of Status and Personal Judgment data than the other types. In part, this reflects concern with the outcomes specified as evaluation criteria in the Education Amendments of 1976, namely "the extent to which [vocational] program completers and leavers . . . find employment in occupations related to their training, and . . . are considered by their employers to be well-trained and prepared for employment" (Sec. 112). These particular outcome measures call for Status data and Personal Judgment data, respectively. Certain kinds of data are clearly more appropriate than other types as empirical indicators of particular outcomes (see Figure 4 above). In fact, outcome hypotheses can be formulated so explicitly that particular kinds of data and specific evaluation standards are indicated very precisely for use in performing the evaluation task.

Additional factors influencing the types of outcome data used in evaluation include ease, timing, and costs of collection; credibility; comparability with other available data; amenability to statistical treatment and analysis; potential impact; and the ingenuity and skill of evaluation designers and data gatherers. Inevitably, there are tradeoffs between such considerations as the ease and economy of collecting softer data of the Personal Judgment type and "hard" Monetary, Status, or Performance data, which might have higher potential impact on certain audiences.

Further attention will be given to these data-related issues in the second year of the National Center study, especially as efforts are made to develop operational procedures for particular outcome measures.

IV. SUMMARY AND RECOMMENDATIONS

As an "instrumental" contribution to answering the research question "What particular outcomes are appropriate for use as criteria to evaluate vocational education programs?", this paper has attempted to identify and clarify some key concepts and issues related to educational outcomes.

Table II

TYPES OF DATA USED IN VOCATIONAL EDUCATION OUTCOMES EVALUATION

Type of Data	Nature of Observation	Method of Observation	Examples
Status	Objective	Observation and reporting of circumstance by a second party or directly by respondent.	Labor force status of former vocational students. School enrollment status of students currently or formerly enrolled in vocational programs.
Monetary	Objective	Observation by a second party of circumstances reportable in money terms.	Hourly wages of former vocational and nonvocational students. Annual earnings of former students. Cost and benefits of vocational programs.
Personal Judgment	Subjective	Expressed directly by respondent.	Student opinions or perceptions concerning quality and relevance of vocational programs. Employer assessment of the extent to which students are well trained and prepared for employment.
Ascriptive	Objective	Characterization by a second party based on records, test results, and/or observation and professional assessment.	Work-related attitudes and attributes of students. Vocational interests and aspirations of students.
Performance	Objective	Written or other tests of cognitive and psychomotor knowledge and skills.	Score on skill proficiency achievement test. Score on reading/math achievement test.

Two additional components were completed during the first year of The National Center's study of vocational education outcomes and are recommended as companion references: (1) "Vocational Education Outcome Studies: An Evaluative Annotated Bibliography Including an Appendix of Key Related Literature," (included as Attachment "A" in the present report); and (2) "Thesaurus of Vocational Education Outcome Questions" (Attachment "B" in the report). It is hoped that these products will help stimulate conceptual and empirical work in the field and prove useful as points of reference for future commentary and reporting.

A. Examining Vocational Education Outcomes

Vocational education outcomes were defined in this paper as "the consequences of vocational programs." Figure 3 depicted the range and diversity of possible outcomes associated with high school, post-secondary, and adult vocational education programs. It was emphasized that educational outcomes are not limited simply to the goals, objectives, and benefits of vocational programs but also include unintended consequences ("side effects") which may be evaluated in positive or negative terms. Expanded awareness of the range and diversity of possible outcomes can help offset narrrow perceptions that inhibit research, evaluation, program implementation, and policy making. Table I listed 30 vocational education outcome questions, illustrating such diverse themes as the acquisition of knowledge and occupational skills, economic development, employment, earnings, leadership development, student and parental satisfaction with schooling, educational and occupational discrimination, job satisfaction, personal self-image, occupational mobility, work-related attitudes, career planning, job-search skills, employment opportunities for women, and economic returns to schooling. Some of the outcomes identified in these questions apply to individual students while others are more broadly societal in nature.

An analytical framework for evaluation was suggested in Figure 2 based on an educational production function and similar to the familiar CIPP model (Context, Input, Process, and Product). Figure 1 identified six components of the education enterprise--Student Characteristics, Context, Resources, Goals, Processes, and Outcomes--each of which represents an appropriate object for educational evaluation. Figures 1 and 2 were intended to provide perspective and focus attention on outcomes.

Figure 4 distinguished among educational outcomes (empirical phenomena), outcome statements (verbal expressions), and outcome measures (observable indicators). This methodological framework recognized the need for evaluation standards in order to carry systematic inquiry beyond educational research into the sphere of evaluation proper. Figure 4 also listed four potential areas in which evaluation findings might be applied--policy, program design, program management, and accountability--whether for program improvement or other purposes. The importance of formulating outcome statements explicitly and unambiguously was emphasized both for clarity of thinking and communication. An outcome statement or question typically identifies an educational treatment, affected entity, and specific outcome as well as the agency through which the treatment is delivered. An outcome statement may also identify a time framework and rationale for the stated outcome.

Among the key issues identified in the area of outcomes evaluation were the definition of vocational education, the specification of vocational programs as educational treatments (see Figure 5), sources and uses of evaluative criteria, experimental controls, and the use of comparison groups in evaluating vocational education programs with respect to specified outcomes. Table II distinguished five types of data used in outcomes evaluation, classified according to the nature of the observation and methods of data collection. A review of outcome studies disclosed heavier use of Status and Personal Judgment data as opposed to Monetary, Ascriptive, and Performance data, with corresponding implications for generalizability, credibility, and impact on potential audiences.

B. Suggested Agenda for Improving Outcomes Evaluation

Paramount among the recommendations we can offer for improving the art of outcomes evaluation is the formulation of a research and development agenda to be conscientiously followed over a period of say five years aimed at producing clear, accurate, relevant, credible, and communicable findings. Salient features of such an agenda would be conceptual and empirical answers to such questions as:

(1) What is vocational education?

(2) Who are vocational students?

(3) What are the outcome goals of vocational education?

(4) What outcomes should be used as criteria to

evaluate vocational education, and why?[32]

(5) What data are needed to describe and assess the effects of vocational education from the national as well as state and local perspectives, and how can such data be best collected and analyzed?

(6) What standards should be applied to particular outcome measures for purposes of evaluation, and how should they be determined?

(7) What specific "input" variables (under the headings of Student Characteristics, Educational and Social Context, Resources, Goals, and Processes) in the vocational education enterprise are significantly associated with particular Outcomes, and how are they functionally related?

(8) To what extent do extraneous forces and error factors inhibit the production of knowledge concerning "the correlates" of particular vocational education outcomes?

(9) What evaluation methods and procedures should be used to produce accurate and credible generalizations at the national level regarding the outcomes of vocational education?

(10) How can evaluation findings on vocational education outcomes best be communicated to relevant audiences, including policy makers, practitioners, and other evaluators?

The conceptual and empirical answers prescribed for these questions must be meaningful and well documented so they can serve as a basis for developing authoritative, widely shared definitions and standards. Where value criteria are lacking and where empirical evidence is incomplete and conceptualizations imprecise, deficiencies should be openly acknowledged and a cogent rationale provided to justify whatever course of action is adopted as an expedient in light of the specified rational-empirical-normative gaps.

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[32] This is the research question currently being addressed in the study to which this essay contributes. We feel that in its first year, this multi-year project progressed about 35%-45% of the way toward developing some meaningful and useful answers to the question. During Year Two (January 1979 to January 1980), attention will be focused on approximately six to eight specific outcomes--designing operational procedures and determining the extent to which the selected outcomes and procedures are regarded by relevant audiences as appropriate for use in evaluating vocational programs.

Action on the recommended R & D agenda requires a willingness to acknowledge--with neither defensiveness nor resignation--existing shortcomings as well as the strengths of vocational education, both with respect to program performance and the knowledge we possess about the system's components and impact. And the "high tolerance for ambiguity" that is sometimes counseled for vocational education researchers and evaluators needs to be challenged in the interests of vocational education's commitment to quality and responsiveness.

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